RD Sharma Solutions Class 9 Maths Chapter 20: RD Sharma Solutions for Class 9 Maths Chapter 20 Surface Area and Volume of a Right Circular Cone, is a helpful resource for students. This chapter covers topics related to cones and their measurements.

The solutions provided in this chapter are designed to be easy to understand and follow. Each solution is explained step-by-step, making it easier for students to comprehend and apply the concepts.

By using RD Sharma Solutions, students can improve their understanding of the chapter and perform better in exams. These solutions are a valuable resource for students to practice and master the concepts of Surface Area and Volume of a Right Circular Cone.

RD Sharma Solutions Class 9 Maths Chapter 20 Surface Area and Volume of a Right Circular Cone PDF

You can access the PDF file for RD Sharma Solutions Class 9 Maths Chapter 20, which covers Surface Area and Volume of a Right Circular Cone, by clicking the link provided below. This resource provide detailed explanations and solutions to help students understand and solve problems related to cones effectively.

Whether you need assistance with understanding concepts or practicing questions, this PDF provides comprehensive support for mastering the chapter. Simply click the link to access the PDF and enhance your understanding of Surface Area and Volume of a Right Circular Cone.

RD Sharma Solutions Class 9 Maths Chapter 20 Surface Area and Volume of a Right Circular Cone PDF

RD Sharma Solutions Class 9 Maths Chapter 20 Surface Area and Volume of a Right Circular Cone

Below, you'll find the solutions for RD Sharma Class 9 Maths Chapter 20, which focuses on Surface Area and Volume of a Right Circular Cone. These solutions provide comprehensive explanations and step-by-step answers to help you understand and solve problems related to cones effectively. Whether you're looking to clarify concepts or practice questions for better comprehension, these solutions are a valuable resource to aid your learning process.

RD Sharma Solutions Class 9 Maths Chapter 20 Surface Area and Volume of a Right Circular Cone Exercise 20.1 Page No: 20.7

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:

The slant height of cone (l) = 60 cm

The radius of the base of the cone (r) = 21 cm

Now,

Curved surface area of the right circular cone = πrl = 22/7 x 21 x 60 = 3960 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 the vertical height is 12cm. Find the area of the curved surface.

Solution:

The radius of cone (r) = 5 cm

Height of cone (h) = 12 cm

Find the slant Height of cone (l):

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

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

$l^2 = 25 + 144 = 169$

Or l = 13 cm

Now,

C.S.A = πrl =3.14 x 5 x 13 = 204.28

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

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

Solution:

Radius of cone(r) = 7 cm

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

We know, C.S.A. = πrl

⇒ πrl = 176

⇒ 22/7 x 7 x l = 176

or l = 8

Therefore, the slant height of the cone is 8 cm.

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

Solution:

Height of cone(h) = 21 cm

The slant height of cone (l) = 28 cm

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

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

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

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

Now,

Area of the circular base = πr^2

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

=1078

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

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

Solution:

The radius of cone (r) = 6 cm

Height of cone (h) = 8 cm

The total surface area of the cone (T.S.A)=?

Find the slant height of the cone:

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

$=6^2+8^2$

= 36 + 64

= 100

or l = 10 cm

Now,

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

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

= (22/7 x 6 x 10) + (22/7 x 6 x 6)

= 1320/7 + 792/7

= 301.71

Therefore, the area of the base is 301.71 cm2.

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) = πrl

=22/7 x 5.25 x 10

= 165

Therefore, the curved surface area of the cone is 165 cm2.

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

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

= (22/7 x 12 x 21) + (22/7 x 12 x 12)

= 1244.57

Therefore, the total surface area of the cone is 1244.57 m^2.

Question 8: The area of the curved surface of a cone is 60 π cm^2. If the slant height of the cone is 8 cm, find the radius of the base.

Solution:

Curved surface area(C.S.A)= 60 π cm^2

Slant height of the cone(l) = 8 cm

We know, Curved surface area(C.S.A)=πrl

⇒ πrl = 60 π

⇒ r x 8 = 60

or r = 60/8 = 7.5

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

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

Solution:

Diameter of the cone(d) = 70 cm

So, radius of the cone(r)= diameter/2 = 70/2 cm = 35 cm

Curved surface area = 4070 cm^2

Now,

We know, Curved surface area = πrl

So, πrl = 4070

By substituting the values, we get

22/7 x 35 x l = 4070

or l = 37

Therefore, the slant height of the 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 π =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 the cone.

Now,

Curved surface area (C.S.A.) = πrl

So, 22/7 x (4x) x (7x) = 792

or $x^2 = 9$

or x = 3

Therefore, radius = 4x = 4(3) cm = 12 cm

RD Sharma Solutions Class 9 Maths Chapter 20 Surface Area and Volume of a Right Circular Cone Exercise 20.2 Page No: 20.20

Question 1: Find the volume of the right circular cone with:

(i) Radius 6cm, height 7cm

(ii)Radius 3.5cm, height 12cm

(iii) Height is 21cm and slant height 28cm

Solution:

(i) Radius of cone(r)=6cm

Height of cone(h)=7cm

We know, Volume of a right circular cone = $1/3\ \pi r^2 h$

By substituting the values, we get

$= 1/3 \times 3.14 \times 6^2 \times 7$

$= 264$

The volume of a right circular cone is 264 cm^3

(ii) Radius of cone(r)=3.5 cm

Height of cone(h)=12cm

The volume of a right circular cone = $1/3\ \pi r^2 h$

By substituting the values, we get

$= 1/3 \times 3.14 \times 3.5^2 \times 12$

$=154$

The volume of a right circular cone is 154 cm^3

(iii) Height of cone(h)=21 cm

Slant height of cone(l) = 28 cm

Find the measure of r:

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

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

or $r = 7\sqrt{7}$

Now,

The volume of a right circular cone = $1/3\ \pi r^2 h$

By substituting the values, we get

= 1/3 x 3.14 x $(7\sqrt{7})^2$ x 21

=7546

The volume of a right circular cone is 7546 cm^3

Question 2: Find the capacity in litres of a conical vessel with:

(i) radius 7 cm, slant height 25 cm

(ii) height 12 cm, slant height 13 cm.

Solution:

(i) Radius of the cone(r) =7 cm

The slant height of the cone (l) =25 cm

As we know that, $l^2 = r^2 + h^2$

$25^2 = 7^2 + h^2$

or h = 24

Now, the volume of a right circular cone = = 1/3 $\pi r^2 h$

By substituting the values, we get

= 1/3 x 3.14 x $(7)^2$ x 24

= 1232

The volume of a right circular cone is 1232 cm^3 or 1.232 litres

[1 cm^3 = 0.01 liter]

(ii) Height of cone(h)=12 cm

Slant height of cone(l)=13 cm

As we know that, $l^2 = r^2 + h^2$

$13^2 = r^2 + 12^2$

or r = 5

Now, the volume of a right circular cone = 1/3 $\pi r^2 h$

By substituting the values, we get

= 1/3 x 3.14 x $(5)^2$ x 12

= 314.28

The volume of a right circular cone is 314.28 cm^3 or 0.314 litres.

[1 cm^3 = 0.01 liters]

Question 3: Two cones have their heights in the ratio 1:3 and the radii of their bases in the ratio 3:1. Find the ratio of their volumes.

Solution:

Let the heights of the cones be h and 3h and the radii of their bases be 3r and r, respectively. Then, their volumes are

Volume of first cone (V1) = 1/3 $\pi(3r)^2h$

Volume of second cone (V2) = 1/3 $\pi r^2(3h)$

Now, V1/V2 = 3/1

The ratio of the two cone's volumes is 3:1.

Question 4: The radius and the height of a right circular cone are in the ratio 5:12. If its volume is 314 cubic metre, find the slant height and the radius. (Use π=3.14).

Solution:

Let us assume the ratio of the radius and the height of a right circular cone to be x.

Then, radius be 5x and height be 12x

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

= $(5x)^2 + (12x)^2$

= 25 x^2 + 144 x^2

or l = 13x

Therefore, the slant height is 13 m.

Now it is given that volume of the cone = 314 m^3

$\Rightarrow 1/3\pi r^2h = 314$

$\Rightarrow 1/3 \times 3.14 \times (25x^2) \times (12x) = 314$

$\Rightarrow x^3 = 1$

or x = 1

So, radius = 5x 1 = 5 m

Therefore,

Answer: Slant height = 13m

Radius = 5m

Question 5: The radius and height of a right circular cone are in the ratio 5:12 and its volume is 2512 cubic cm. Find the slant height and radius of the cone. (Use π=3.14).

Solution:

Let the ratio of the radius and height of a right circular cone be y.

Radius of cone(r) = 5y

Height of cone (h) =12y

Now we know, $l^2 = r^2 + h^2$

$= (5y)^2 + (12y)^2$

$= 25\ y^2 + 144\ y^2$

or l = 13y

Now, the volume of the cone is given $2512 cm^3$

$\Rightarrow 1/3\pi r^2 h = 2512$

$\Rightarrow 1/3 \times 3.14 \times (5y)^2 \times 12y = 2512$

$\Rightarrow y^3 = (2512 \times 3)/(3.14 \times 25 \times 12) = 8$

or y = 2

Therefore,

Radius of cone = 5y = 5×2 = 10cm

Slant height (l) =13y = 13×2 = 26cm

Question 6: The ratio of volumes of two cones is 4:5, and the ratio of the radii of their bases is 2:3. Find the ratio of their vertical heights.

Solution:

Let the ratio of the radius be x and the ratio of the volume be y.

Then, Radius of 1st cone (r_1) =2x

Radius of 2nd cone (r_2) =3x

Volume of 1st cone (V_1)= 4y

Volume of 2nd cone (V_2)= 5y

We know the formula for the volume of a cone = $1/3\pi r^2 h$

Let h_1 and h_2 be the heights of the respective cones.

$$\frac{V_1}{V_2} = \frac{4}{5} = \frac{\frac{1}{3}\pi r_1^2 h_1}{\frac{1}{3}\pi r_2^2 h_2} = \frac{4}{5} = \frac{4h_1}{9h_2} = \frac{4}{5} = \frac{h_1}{h_2} = \frac{9}{5}$$

Therefore, heights are in the ratio of 9:5.

Question 7: A cylinder and a cone have equal radii of their bases and equal heights. Show that their volumes are in the ratio 3:1.

Solution:

We are given, a cylinder and a cone that have equal radii of their bases and heights.

Let the radius of the cone = radius of the cylinder = r and

Height of the cone = height of the cylinder = h

Now,

$$\frac{volume\ of\ cylinder}{volume\ of\ the\ cone} = \frac{\pi r^2 h}{\frac{1}{3}\pi r^2 h} = \frac{3}{1}$$

Therefore, the ratio of their volumes is 3:1.

RD Sharma Solutions Class 9 Maths Chapter 20 Surface Area and Volume of a Right Circular Cone Exercise VSAQs Page No: 20.23

Question 1: The height of a cone is 15 cm. If its volume is 500π cm^3, then find the radius of its base.

Solution:

Height of a cone = 15 cm

Volume of cone = 500 π cm^3

We know, Volume of a cone = 1/3 $\pi r^2 h$

So, 500π = 1/3 π r^2 x 15

r^2 = 100

or r = 10

The radius of the base is 10 cm.

Question 2: If the volume of a right circular cone of height 9 cm is 48π cm^3, find the diameter of its base.

Solution:

Height of a cone = 9 cm

Volume of cone = 48 π cm^3

We know, the volume of a cone = 1/3 $\pi r^2 h$

So, 48π = 1/3 π r^2 x 9

r^2 = 16

or r = 4

The radius of base r = 4 cm

Therefore, Diameter = 2 Radius = 2 x 4 cm = 8 cm.

Question 3: If the height and slant height of a cone are 21 cm and 28 cm, respectively. Find its volume.

Solution:

Height of cone (h) = 21 cm

The slant height of cone (l) = 28 cm

Find the radius of the cone:

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

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

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

Now,

We know, the volume of a cone = $1/3\ \pi r^2 h$

= $1/3 \times \pi \times (7\sqrt{7})^2 \times 21$

= $2401\ \pi$

Therefore, the volume of the cone is 2401 π cm^3.

Question 4: The height of a conical vessel is 3.5 cm. If its capacity is 3.3 litres of milk. Find the diameter of its base.

Solution:

Height of a conical vessel = 3.5 cm and

The capacity of the conical vessel is 3.3 litres or 3300 cm^3

Now,

We know, the volume of a cone = $1/3\ \pi r^2 h$

$3300 = 1/3 \times 22/7 \times r^2 \times 3.5$

or r2 = 900

or r = 30

So, the radius of the cone is 30 cm

Hence, the diameter of its base = 2 Radius = 2×30 cm = 60 cm.