RD Sharma Solutions Class 9 Surface Area And Volume Of Right Circular Cone Ex 20.1

RD Sharma Solutions Class 9 Chapter 20 Exercise 20 1

Q 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:

It is given that :

Slant height of cone(l) = 60 cm

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

Curved surface area(C.S.A) = ?

C.S.A = πrl = $\frac{22}{7}$*21*60=3960cm^2

Therefore the curved surface area of the right circular cone is 3960cm^2

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

Solution:

It is given that:

Radius of cone (r)= 5 cm

Height of the tent (h) = 12 cm

Slant Height of tent (l) = ?

Curved surface area (C.S.A) = ?

Now we know we that,

$l = \sqrt{r^2 + h^2}$

$l^2 = r^2 + h^2$

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

$l^2 == 25 + 144$

=> l = 13 cm

Now,

C.S.A = πrl =3.14*5*12=204.28cm^2

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

Q3 : The radius of a cone is 7 cm and area of curved surface is 176cm^2 **.Find the slant height.**

Solution:

It is given that:

Radius of cone(r) = 7 cm

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

Slant Height of tent (l) = ?

Now we know,

C.S.A=πrl

=>πrl =176

=> $\frac{22}{7} * 7 * l$=176

=>l=$\frac{176*7}{22*7}$ = 8 cm

Therefore the slant height of the cone is 8 cm.

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

Solution:

It is given that :

Height of the traffic cone(h)=21 cm

Slant height of the traffic cone(l) = 28 cm

Now we know that,

$l^2 = r^2 + h^2$

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

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

r= 7$\sqrt{7}$cm

Area of the circular base=πr^2

=$\frac{22}{7} * (7\sqrt{7})^2$=1078 cm^2

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

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

Solution:

It is given that :

Radius of the cone(r) = 6 cm

Height of the cone(h) = 8 cm

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

$l^2 = r^2 + h^2$

=$6^2 + 8^2$

= 36 + 64 = 100

=>l = 10 cm

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

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

= $(\frac{22}{7} * 6 * 10) + (\frac{22}{7} * 6 * 6)$

= $\frac{1320+792}{7}$

= 301.171cm^2.

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

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

Solution:

It is given that :

Base radius of the cone(r) = 5.25 cm

Slant height of the cone(l) = 10 cm

Curved surface area (C.S.A) = πrl

=$\frac{22}{7}$*5.25*10=165cm^2.

Therefore the curved surface area of the cone is 165cm^2

Q 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:

It is given that :

Diameter of the cone(d)=24 m

Radius of the cone(r)= $\frac{24}{2}$ =12m

Slant height of the cone(l) = 21 m

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

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

= $(\frac{22}{7} * 12 * 21) + (\frac{22}{7} * 12 * 12)$ = $\frac{22}{7} * 12(12 + 21)$ = 1244.57m^2.

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

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

Solution:

It is given that :

Curved surface area(C.S.A)= 60 π cm^2

Slant height of the cone(l) = 8 cm

Radius of the cone(r)=?

Now we know,

Curved surface area(C.S.A)=πrl

=> πrl =60 π cm^2

=> r*8 = 60

=> r = 7.5 cm

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

Q 9: The curved surface area of a cone is 4070 cm^2 and diameter is 70 cm .What is its slant height?

Solution:

Diameter of the cone(d) = 70 cm

Radius of the cone(r)= $\frac{d}{2}$ =35cm

Slant height of the cone(l)=?

Now,

Curved surface area=4070cm^2

=>πrl = 4070

Where, r = radius of the cone

l = slant height of the cone

Therefore πrl =4070

=>$\frac{22}{7} * 35 * l$=4070

=>l = $\frac{4070*7}{22*35}$ = 37 cm

Therefore slant height of the cone is 37 cm.

Q 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.

Solution:

It is given that

Curved surface area=πrl =792

Let the radius(r) = 4x

Height(h) = 7x

Now,

C.S.A = 792

$\frac{22}{7} * 4x * 7x$=792

=> 88x^2=792

=> x^2= $\frac{792}{88}$=9

=> x = 3

Therefore Radius = 4x = 4*3 = 12 cm

Q 11: A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps.

Solution:

Given that,

Radius of conical cap(r) = 7 cm

Height of the conical cap(h) = 24 cm

Slant height(l) of conical cap=$\sqrt{r^2+h^2}$

=$\sqrt{7^2+24^2}$cm = 25 cm

C.S.A of 1 conical cap=πrl

= $\frac{22}{7} * 7 * 25$

= 550cm^2

Curved surface area of 0 such conical caps=5500 cm^2

Thus, 5500 cm^2 sheet will be required for making 10 caps.

Q 12: Find the ratio of the curved surface area of two cones if their diameter of the bases are equal and slant heights are in the ratio 4:3.

Solution:

Given that,

Diameter of two coins are equal.

Therefore their radius are equal.

Let r_1 =r_2=r

Let ratio be x

Therefore slant height l_1 of 1st cone=4x

Similarly slant height l_2 of 2nd cone=3x

Therefore $\frac{C.S.A_1}{C.S.A_2}$

=$\frac{\pi*r_1*l_1}{\pi*r_2*l_2}$

=$\frac{\pi*r*4x}{\pi*r*3x}$

=$\frac{4}{3}$

Hence ratio is 4:3

Q 13: There are two cones .The curved surface area of one is twice that of the other. The slant height of the later is twice that of the former. Find the ratio of their radii.

Solution:

Let the curved surface area of 1st cone=2x

C.S.A of 2nd cone=x

Slant height of 1st cone=h

Slant height of 2nd cone=2h

Therefore $\frac{C.S.A\ of\ 1st\ cone}{C.S.A\ of\ 2nd\ cone}$

=$\frac{2x}{x}$

=>$\frac{\pi r_1 l_1}{\pi r_2 l_2}$= $\frac{2}{1}$

=>$\frac{r_1*h}{r_2*h}$= $\frac{2}{1}$

=>$\frac{r_1}{r_2}$= $\frac{4}{1}$

Therefore ratio of $r_1 and\ r_2$ is 4:1.

Q 14: The diameters of two cones are equal. If their slant height are in the ratio 5:4,find the ratio of their curved surfaces.

Solution:

It is given that

Diameters of two cones are equal

Therefore their radius are also equal i.e

$r_1 = r_2$

Let the ratio of slant height be x

Therefore $l_1 = 5x$

l_2=4x

Therefore Ratio of curved surface area=$\frac{c_1}{c_2}$

=>$\frac{c_1}{c_2}$= $\frac{\pi r_1 l_1}{\pi r_2 l_2}$

=$\frac{\pi r_1*5x}{\pi r_2*4x}$

=$\frac{5}{4}$

∴ Ratio of curved surface area is 5:4.

Q 15: Curved surface area of a cone is 308 cm^2 and its slant height is 14cm. Find the radius of the base and total surface area of the cone.

Solution:

(1) It is given that

Slant height of cone=14cm

Let radius of circular end of cone=r

Curved surface area of cone=πrl

=>308 cm^2 =$\frac{22}{7} * r * 14$

=>r=$\frac{308}{44}$ =7cm

Thus radius of circular end of cone=7 cm.

(ii) It is given that C.S.A=308 cm^2

We know that total surface area of a cone

= curved surface area of a cone+Area of base

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

= [308+($\frac{22}{7} * 7^2$)]

= 308+154

= 462cm^2

Thus total surface area of the cone is 462cm^2

Q 16: The slant height and base diameter of a conical tomb are 25m and 14m respectively. Find the cost of white washing its curved surface area at the rate of Rs 210 per 100m^2.

Solution:

It is given that

Slant height of conical tomb(l)=25m

Base radius (r) of tomb=$\frac{14}{2}$=7m

Curved surface area of conical length tomb=πrl

=$\frac{22}{7} * 7 * 25$

=550 m^2

Cost of white washing 100 m^2 area=Rs 210

Cost of white washing 550m^2 area=Rs($\frac{210*550}{100}$) =Rs 1155

Therefore the cost of white washing the whole tomb is Rs 1155.

Q 17: A conical tent is 10 m high and the radius of it base is 24 m. Find the slant height of the tent. If the cost of 1m^2 canvas is Rs 70, find the cost of canvas required for the tent.

Solution:

It is given that

Height of the conical tent(h)=10m

Radius of conical tent(r)=24m

Let slant height of conical tent be l

$l^2 = h^2 + r^2$

=$10^2 + 24^2$=100+576

=676 m^2

=>l=26m

Thus,the slant height of the conical tent is 26m.

(ii) It is given that:

Radius(r) = 24 m

Slant height (l) = 26 m

C.S.A of tent=πrl

=$\frac{22}{7} * 24 * 26$

=$\frac{1378}{7} m^2$

Cost of 1m^2 canvas= Rs 70

Cost of $\frac{1378}{7} m^2$ canvas=Rs $\frac{1378}{7}$*70 = Rs 1,37,280

Thus the cost of canvas required to make the tent is Rs 1,37,280.

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Q 18: A tent is in the form of a right circular cylinder surmounted by a cone. The diameter of cylinder is 24 m. The height of the cylindrical portion is 11m while the vertex of the cone is 16 m above the ground. Find the area of the canvas required for the tent.

Solution:

It is given that

Diameter of cylinder=24 m

$therefore\,radius = \frac{daimeter}{2}$

=$\frac{24}{2}$ = 12 cm

Also radius of cone = 12 m

Height of cylinder = 11 m

Height of cone = 16-11 = 5m

Slant height of cone

= $\sqrt{h^2 + r^2}$

= $\sqrt{5^2 + 12^2}$

= 13m

Therefore area of canvas required for the tent=$\pi rl + 2\pi rh$

=$\frac{22}{7}[(12 * 13) + (2 * 12 * 11)]$ = 490.286 + 829.714

=1320m^2

Q19. A circus tent is cylindrical to a height of 3 m and conical above it. If its diameter is 105 m and the slant height of the conical portion is 53 m, calculate the length of the canvas 5 m wide to make the required tent.

Solution:

Given diameter=105 m,

Radius=$\frac{105}{2}$m = 52.5 m

Therefore curved surface area of circus tent=$\pi rl + 2\pi rh$

=($\frac{22}{7} * 52.5 * 53) + (2 * \frac{22}{7} * 52.5 * 3)$

= 8745 + 990 = 9735 m^2

Therefore length of the canvas required for tent

=$\frac{Area\ of\ canvas}{Width\ of\ canvas}$

=$\frac{9735}{5}$m = 1947 m

Q20 The circumference of the base of a 10m height conical tent is 44m, calculate the length of canvas used in making the tent if width of canvas is 2m.

Solution:

We know that

C.S.A of cone=πrl

Given circumference =$2\pi r$

=>$2 * \frac{22}{7} * r$=44

=>$\frac{r}{7}$=1

=>r = 7m

Therefore $l = \sqrt{r^2 + h^2}$

= $\sqrt{7^2 + 10^2}$

= $l\sqrt{149}$m

Therefore C.S.A of tent =πrl

= $\frac{22}{7} * 7 * \sqrt{149}$

= $22\sqrt{149}$

Therefore the length of canvas used in making the tent

= $\frac{area\ of\ canvas}{width\ of\ canvas}$

= $\frac{22}{2\sqrt{149}}$

= $11\sqrt{149}$

= 134.2 m

Q 21: What length of tarpaulin 4 m wide will be required to make a conical tent of height 8 m and base radius 6 m?Assume that the extra length of material will be required for stitching margins and wastage in cutting is approximately 20 cm.

Solution:

Given that,

Height of conical tent(h) = 8m

Radius of base of tent(r) = 6m

Slant height(l)= $\sqrt{r^2+h^2}$

=$\sqrt{8^2+6^2}$

=$\sqrt{100}$ = $\sqrt{10}$m

C.S.A of conical tent=πrl

=(3.14*6*10) m^2 = 188.4 m^2

Let the length of tarpaulin sheet required be l

As 20 cm will wasted ,so effective

Length will be (l – 0.2 m)

Breadth of tarpaulin = 3m

Area of sheet =C.S.A of sheet

[l*0.2*3]m=188.4 m^2 = l – 0.2 m = 62.8 m

Accounting extra for wastage:

=>l = 63 m

Thus the length of the tarpaulin sheet will be = 63 m

Q 22: A bus stop is barricaded from the remaining part of the road, by using 50 hollow cones made of recycled card board. Each cone has a base diameter of 40 cm and height 1m. If the outer side of each of the cones is to be painted and the cost of painting is Rs 12 per m^2,what will be the cost of painting all these cones?

Solution:

The area to be painted is the curved surface area of each cone.

The formula of the curved surface area of a cone with base radius and slant height 7 is given as

Curved Surface Area = πrl

For each cone, we're given that the base diameter is 0.40 m.

Hence the base radius r = 0.20 m.

The vertical height l 1 = 1 m.

To find the slant height 'l' to be used in the formula for Curved Surface Area we use the following relation

Slant height ,

$l=\sqrt{r^2+h^2}$

$=\sqrt{0.2^2+1^2}$

$=\sqrt{0.04+1}$

$=\sqrt{1.04}$

l = 1.02 m

Now substituting the values of r = 0.2 m and slant height 1= 1.02 m and using pi = 3.14 in the formula of C.S.A.

We get Curved Surface Area = (3.14)(0.2)(1.02) = 0.64056 m^2

This is the curved surface area of a single cone.

Since we need to paint 50 such cones the total area to be painted is,

Total area to be painted = (0.64056) (50) = 32.028 m^2

The cost of painting is given as Rs. 12 per m^2

Hence the total cost of painting = (12) (32.028) = 384.336

Hence, the total cost that would be incurred in the painting is Rs. 384.336

Q23. A cylinder and a cone have equal radii of their base and equal heights. If their curved surface area are in the ratio 8:5, show that the radius of each is to the height of each as 3:4.

Solution:

It is given that the base radius and the height of the cone and the cylinder are the same.

So let the base radius of each is ' r ' and the vertical height of each is 'h'.

Let the slant height of the cone be ' l '.

The curved surface area of the cone = $\pi r l$

The curved surface area of the cylinder = Extra close brace or missing open brace

It is said that the ratio of the curved surface areas of the cylinder to that of the cone is 8:5

So,

$\frac{2\pi r h}{\pi r l} = \frac{8}{5}$

$\frac{2h}{l} = \frac{8}{5}$

$\frac{h}{l} = \frac{4}{5}$

But we know that $l = \sqrt{r^2 + h^2}$

$\frac{h^2}{\sqrt{r^2+h^2}} = \frac{4}{5}$

Squaring on both sides we get:

$\frac{h^2}{r^2+h^2} = \frac{16}{25}$

$\frac{r^2}{h^2} + 1 = \frac{25}{16}$

$\frac{r^2}{h^2} = \frac{25}{16} - 1$

$\frac{r^2}{h^2} = \frac{9}{16}$

$\frac{r}{h} = \frac{3}{4}$

Hence it is shown that the ratio of the radius to the height of the cone as well as the cylinder is: 3 : 4

RD Sharma Solutions Class 9 Surface Area And Volume Of Right Circular Cone Ex 20.2

RD Sharma Solutions Class 9 Chapter 20 Exercise 20.2

Q1.Find the volume of the right circular cone with the following dimensions:

(a)Radius is 6cm and the height of the cone is 7cm

(b)Radius is 3.5cm and height is 12cm

(c)Slant height is 21cm and height is 28cm

Solution:

(a) It is given that

Radius of the cone(r)=6cm

Height of the cone(h)=7cm

Volume of a right circular cone

=$\frac{1}{3}\pi r^2 h$

= $\frac{1}{3}*3.14*6^2*7$ =264 cm^3

(b) It is given that:

Radius of the cone(r)=3.5 cm

Height of the cone(h)=12cm

Volume of a right circular cone

=$\frac{1}{3}\pi r^2 h$

= $\frac{1}{3}*3.14*3.5^2*12$

=154 cm^3

(c) It is given that:

Height of the cone(h)=28 cm

Slant height of the cone(l)=21 cm

As we know that,

$l^2=r^2+h^2$

$r=\sqrt{l^2-h^2}$

$r=\sqrt{28^2-21^2}$ = $7\sqrt{7}$

Volume of a right circular cone:

=$\frac{1}{3}\pi r^2 h$

= $\frac{1}{3}*3.14*(7\sqrt{7})^2*18$

=7546cm^3

Q2.Find the volume of a conical tank with the following dimensions in liters:

(a)Radius is 7cm and the slant height of the cone is 25cm

(b)Slant height is 12cm and height is 13cm

Solution:

(a) It is given that

Radius of the cone(r) =7 cm

Slant height of the cone (l) =25 cm

As we know that,

$l^2=r^2+h^2$

$h=\sqrt{l^2-r^2}$

h =$\sqrt{25^2-7^2}$

= $r=\sqrt{625-49}$ =24 cm

Volume of a right circular cone

=$\frac{1}{3}\pi r^2 h$

= $\frac{1}{3}*3.14*7^2*24$

=1232cm^3=1.232litres [1 cm^3=0.01l]

(c) It is given that:

Height of the cone(h)=12 cm

Slant height of the cone(l)=13 cm

As we know that,

$l^2=r^2+h^2$

$r=\sqrt{l^2-h^2}$

r =$\sqrt{13^2-12^2}$

= $r=\sqrt{169-144}$=$\sqrt{25}$ = 5cm

Volume of a right circular cone:

=$\frac{1}{3}\pi r^2 h$

= $\frac{1}{3}*3.14*5^2*10$ = 314.85cm^3=0.307litres [1 cm^3=0.01l]

Q3. 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 ratio of the height of the cone be h_x

height of the 1st cone= h_x

height of the of the 2nd cone =3h_x

Let the ratio of the radius of the of the cone= r_x

radius of the 1st cone=3 r_x

radius of the 2nd cone =r_x

The ratio of the volume= $\frac{v_1}{v_2}$

Where v_1=volume of 1st cone

v_2=volume of 2nd cone

=>$\frac{v_1}{v_2}$=$\frac{\frac{1}{3}\pi*r_a^2h_a}{\frac{1}{3}\pi r_b^2h_b}$

=$\frac{r_a^2h_a}{r_b{}^2h_b}$

=$\frac{3r_x^2h_x}{r_x{}^2h_x}$

=$\frac{9r_x^2h_x}{3r_x{}^2h_x}$

=$\frac{3}{1}$

=>$\frac{v_1}{v_2}$= $\frac{3}{1}$

Q4. The radius and the height of a right circular cone are in the ratio 5:12. If its volume is 314 cubic meter, find the slant height and the radius. (Use π=3.14).

Solution:

Let us assume the ratio to be y

Radius (r)=5y

Height (h)=12y

We know that

$l^2=r^2+h^2$

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

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

=169^2 = 13y

Now it is given that volume=314m^3

=>$\frac{1}{3}\pi r^2 h$= 314m^3

=>$\frac{1}{3}*3.14*25y^2*12y$= 314$m^3$

=>y^3=1

=>y=1

Therefore ,

Slant height(l) =13y=13m

Radius =5y=5m

Q5. 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 be y

The radius of the cone(r)=5y

Height of the cone=12y

Now we know,

Slant height(l)=$\sqrt{r^2+h^2}$

=$\sqrt{5y^2+12y^2}$

=13y

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

=>$\frac{1}{3}\pi r^2 h$=2512

=>$\frac{1}{3}*3.14*5y^2*12y$=2512

=>y^3= $\frac{2512*3}{3.14*25*2}$

=>y=2

Therefore,

Slant height(l) =13y=13*2=26cm

Radius of cone=5y=5*2=10cm

Q6. 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

Radius of 1st cone =2x

Radius of 2nd cone=3x

Let the ratio of the volume be y

Volume of 1st cone=4y

Volume of 2nd cone=5y

$\frac{y_1}{y_2}$= $\frac{4y}{5y}$

= $\frac{4}{5}$

=> $\frac{\frac{1}{3}\pi r_a^2 h_a}{\frac{1}{3}\pi r_b^2 h_b}$= $\frac{4}{5}$

=> $\frac{h_a*(2x)^2}{h_b*(3x)^2}$= $\frac{4}{5}$

=>$\frac{h_a*4x^2}{h_b*9x^2}$ =$\frac{4}{5}$

=>$\frac{h_a}{h_b}$= $\frac{36}{20}$= $\frac{9}{5}$

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

Q7. 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:

It's given that

A cylinder and a cone are having equal radii of their bases and heights

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

Height of the cone=height of the cylinder=h

Let the volume of cone=v_x

Volume of cylinder=v_y

=>$\frac{v_x}{v_y}$= $\frac{\frac{1}{3}\pi r^2 h}{\pi r^2 h}$= $\frac{1}{3}$

=> $\frac{v_y}{v_x} = \frac{3}{1}$

Therefore the ratio of their volumes is 3:1.

Q8. If the radius of the base of a cone is halved, keeping the height same, what is the ratio of the volume of the reduced cone to that of the original cone?

Solution:

Let the radius of the cone be r_x $and\ height\ be\ h_x$

Then the volume of cone v_x=$\frac{1}{3}\pi r_x^2 h_x$

Now,

Radius of the reduced cone=$\frac{r_x}{2}$

Therefore volume of reduced cone v_y

= $\frac{1}{3}\pi(\frac{r}{2})^2 * h_x$

=$\frac{1}{12} * \pi * r_x x^2 * h_x$

$\therefore \frac{v_y}{v_x}$= $\frac{\frac{1}{12}\pi r^2 h}{\frac{1}{3}\pi r^2 h}$

=$\frac{3}{12}$ = $\frac{1}{4}$

Therefore the ratio between the volumes of the reduced and the original cone is 1:4.

Q9. A heap of wheat is in the form of a cone of diameter 9 m and height 3.5 m. Find its volume. How much is canvas cloth required to just cover the heap? (Use π=3.14).

Solution:

It is given that

Diameter of heap(d)=9m

Therefore, Radius of the heap(r)

= $\frac{d}{2}$

=$\frac{9}{2}$=4.5m

Height of the heap(h)=3.5m

Therefore, Volume of the heap=$\frac{1}{3}\pi r^2 h$

=$\frac{1}{3} * 3.14 * 4.5^2 * 3.5$

=74.18m^3

Now,

$l = \sqrt{r^2 + h^2}$

=$\sqrt{4.5^2 + 3.5^2}$ =5.70m

Area to be covered by the cloth=Curved surface area of the heap

=πrl = 3.14*4.5*5.70 = 80.54 m^3

Q10. Find the weight of a solid cone whose base is of diameter 14 cm and vertical height 51 cm, supposing the material of which it is made weighs 10 grams per cubic cm.

Solution:

It is given that :

Diameter(d)=14cm

Height of the cone(h)=51cm

Radius of the cone(r)=$\frac{d}{2}$

=$\frac{14}{2}$ = 7cm

Therefore, Volume of cone(V)= $\frac{1}{3}\pi r^2 h$=

=$\frac{1}{3}$*3.14*7*5*51 = 2618 cm^3

Now it is given that 1 cm^3 material weighs 10gm.

Therefore, 2618cm^3 weighs=2618*10=26180 grams.

Q11. A right angled triangle of which the sides containing the right angle are 6.3 cm and 10 cm in length, is made to turn round on the longer side. Find the volume of the solid, thus generated. Also, find its curved surface area.

Solution:

It is given that

Radius of cone(r)=6.3cm

Height of the cone(h)=10cm

We know that

Slant height(l)= $l = \sqrt{r^2 + h^2}$

=$l = \sqrt{6.3^2 + 10^2}$ = 11.819cm

Therefore Volume of cone(v)= $\frac{1}{3}\pi r^2 h$

= $\frac{1}{3} * 3.14 * 6.3^2 * 10$ = 415.8cm^3

Curved surface area of cone=πrl

= 3.14*6.3*11.819 = 234.01cm^2

Q12 Find the volume of the largest right circular cone that can be fitted in a cube whose edge is 14 cm.

Solution:

Radius of the base of the largest cone=$\frac{1}{2}$*edge of the cube

=$\frac{1}{2}$ *14=7cm

Height of the cone=Edge of the cube=14cm

Therefore, Volume of cone(v)= $\frac{1}{3}\pi r^2 h$

= $\frac{1}{3} * 3.14 * 7^2 * 14$ = 718.66 cm^3

Q13 The volume of a right circular cone is 9856 cm^3.If the diameter of the base is 28 cm. Find:

(a)Height of the cone

(b)Slant height of the cone

(c)Curved surface area of the cone

Solution:

(a) It is given that diameter of the cone(d)=28cm

Radius of the cone(r)=$\frac{d}{2}$

=$\frac{28}{2}$ = 14cm

Height of the cone = ?

Now,

Volume of the cone(v)=$\frac{1}{3}\pi r^2 h$=9856 cm^3

=>$\frac{1}{3} * 3.14 * 14^2 * h = 9856$

=>$h = \frac{9856*3}{3.14*14*14} = 48cm$

Therefore the height of the cone is 48cm

(b) It is given that

Radius of the cone(r)=14cm

Height of the cone=48cm

Slant height (l)=?

Now we know that $l = \sqrt{r^2 + h^2}$

=$\sqrt{14^2 + 48^2}$ = $\sqrt{2500}$ =50cm

Therefore the slant height of the cone is 50cm.

(c) Radius of the cone(r)=14cm

Slant height of the cone(l)=50cm

Curved surface area(C.S.A) = ?

Curved surface area of a cone (C.S.A) = πrl

= 3.14*14*50=2200 cm^2

Therefore curved surface of the cone is 2200 cm^2

Q14. A conical pit of top diameter 3.5m is 12m deep. What is its capacity in kilolitres?

Solution:

It is given that :

Diameter of the conical pit(d)=3.5m

Height of the conical pit(h)=12m

Radius of the conical pit(r)=?

Volume of the conical pit(v)=?

Radius of the conical pit(r)=$\frac{d}{2}$ = $\frac{3.5}{2}$ = 1.75m

Volume of the cone(v)=$\frac{1}{3}\pi r^2 h$

=$\frac{1}{3} * 3.14 * 1.75^2 * 12$ = 38.5m^3

Capacity of the pit =(38.5*1)kilolitres = 38.5 kilolitres

Q15. Monica has a piece of Canvas whose area is 551m^2. She uses it to have a conical tent made, with a base radius of 7m. Assuming that all the stitching margins and wastage incurred while cutting amounts to approximately 1 m^2. Find the volume of the tent that can be made with it.

Solution:

It is given that:

Area of the canvas= 551m^2

Area that is wasted=1m^2

Radius of tent=7m , Volume of tent(v)=?

Therefore the Area of available for making the tent=(551-1)=550 m^2

Surface area of tent=550 m^2

=>πrl =550

=>l=$\frac{550}{22}$ =25m

Slant height(l)=25m

We know that,

$l^2 = r^2 + h^2$

25^2= 7^2+h^2

=>625-49=h^2

=>576=h^2

h=24m

Height of the tent is 24m.

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

=$\frac{1}{3} * 3.14 * 7^2 * 24$ = 1232 m^3

Therefore the volume of the conical tent is 1232 m^3..