9. SURFACE AREA AND VOLUME

EXTRA QUESTION

Q.1). $16 \times 14 \times 20$ cm are the measure of a cuboid find the total Surface area.

Solution:

$l = 16$ cm , b =14 cm , h = 20 cm

∴ Total surface area of cuboid = $2(lb + bh + lh)$

$= 2(16 \times 14 + 14 \times 20 + 16 \times 20)$

$= 2(224 + 280 + 320)$

$= 2 \times 824$

$= 1648 \text{ cm}^2$

∴ Total surface area of the cuboid = 1648 cm^2

Q.2) Side of a cube is 60 cm. find the total surface area of the Cube.

Solution:

Total surface area of cube = $6l^2$

$= 6 \times (60)^2$

$= 6 \times 3600$

$= 21600 \text{ cm}^2$

∴ Total surface area of cube = 21600 cm^2

Q.3). Perimeter of one surface of cube is 24 cm , then find

(i) Total surface area (ii) volume of the cube

Solution:

Perimeter of one surface of cube = 24 cm

But, perimeter of one surface of cube = $4l$

$\therefore 4 \times l = 24$

$l = \frac{24}{4}$

$l = 6$ cm

$\therefore$ length of the cube is 6 cm

(i) $\therefore$ Total surface area of cube = $6l^2$

$= 6 \times 6^2$

$= 216\ cm^2$

(ii) $\therefore$ volume of cube = l^3

$= 6^3$

$= 216 cm^3$

$\therefore$ Total surface area of cube is 216 cm^2 and

Volume of the cube is 216 cm^3

Q. 4). 1000 cm^3 is volume of a cube .find the total surface area of the cube.

Solution:

$(side)^3$ = volume of the cube

$\therefore\ l^3 = 1000\ cm^3$

$\therefore\ l = 10cm$

Total surface area of cube $= 6l^2$

$= 6 \times 10^2$

$= 6 \times 100$

$= 600\ cm^2$

Q.5). Radius of cylinder is 3 cm , height is 7 cm find

(i) curved surface area (ii) total surface area

(iii) volume of the cylinder $(\pi = \frac{22}{7})$

Solution: Radius ®= 3 cm height (h) 7 cm

(i) Curved surface area of the cylinder = $2\pi rh$

$= 2 \times \frac{22}{7} \times 3 \times 7$

$= 2 \times 22 \times 3$

$= 132\ cm^2$

(ii) Total surface area of the cylinder = $2\pi r\ (h + r)$

$= 2 \times \frac{22}{7} \times 3 \times (3 + 7)$

$= 2 \times \frac{22}{7} \times 3 \times 10$

$= \frac{1320}{7}$

$= 188.57\ cm^2$

(iii) volume of cylinder $= \pi r^2 h$

$= \frac{22}{7} \times 3^2 \times 7$

$= 22 \times 3 \times 3$

$= 198 cm^3$

Q.6) volume of cylinder is 1584 cm^3 and ratio of radius and Height ,r: h is 3:7 find radius and hight of the cylinder.

Solution:

Given, r : h = 3 : 7

Let x be the common multiple

∴ Radius r =3x and height h = 7x

Volume of the cylinder

$\pi r^2 h = 1584$

$\therefore \frac{22}{7} \times (3x)^2 \times 7x = 1584$

$22 \times 9x^2 \times x = 1584$

$\therefore 198x^3 = 1584$

$x^3 = \frac{1584}{198}$

$x^3 = 8$

$x = 8$

Radius of cylinder , $r = 3 \times 2 = 6$ cm

Heart of cylinder $h = 7 \times 2 = 14$ cm

Q.7) perimeter of one surface of cube is 12 cm find the volume Of the cube.

Solution:

Perimeter of one surface of the cube

$4 \times l = 12$

$l = \frac{12}{4}$

$l = 3$ cm

Volume of the cube $= (l)^3$

$= (3)^3$

$= 27cm^3$

Q.8). length of cuboid is 10 m ,breath is 6 m and height is 7 cm

Find the area of four vertical faces of the cuboidal

Solution:

l = 10 m, b = 6 m , h = 7 m

Area of four vertical faces of cuboid

= 2 (l + b) × h

= 2 (10 + 6) × 7

= 2 × 16 × 7

= $224m^2$

Q.9). side of a cube is 6 cm and base radius of cylinder is 7

Cm and height is 8 cm if both the objects are to be

Packed with gift paper how many sq.cm paper is Required.

Solution:

Side of cube l = 6 cm

∴ total surface area of the cube = $6l^2$

= 6×6^2

= 6 × 6 × 6

= $216cm^2$

Base radius of the cylinder, r = 7 cm and height h =8 cm

∴ total surface area of the cylinder

$=2\pi r\ (h + r)$

$= 2 \times \frac{22}{7} \times 7\ (7 + 8)$

$= 2 \times \frac{22}{7} \times 7 \times 15$

$= 2 \times 22 \times 15$

$= 660\ cm^2$

Now total sq.cm paper required for both the objects

= Total surface area of the cube + total surface area of the cylinder

= 216 + 660

$= 876\ cm^2$

Q.10). A box has height of 15 cm and area of its vertical faces is 540 cm^2. find the perimeter of the base of the box

Solution:

Area of vertical faces of the box = $540\ cm^2$

$\therefore 2(l + b) \times h = 54$

$\therefore 2\ (l + b) \times 15 = 540$

$\therefore 2\ (l + b) = \frac{540}{15}$

= 36 cm

∴ perimeter of the base of the box is 36 cm.

Q.11). A wheel radius is 15 cm and its height is 9 cm, find its Curved surface area

Solution:

Radius r = 15 cm height h = 9 cm

∴ curved surface area of the wheel

$= 2\pi rh$

$= 2 \times 3.14 \times 15 \times 9$

$= 270 \times 3.14$

$= 847.8 cm^2$

∴ curved surface area of the wheel is $847.8 cm^2$

Q.12) Find the volume the total surface area and the lateral surface area of a cuboid which is 15 m long. 12, wide and 4.5 m height

Solution:

l = 15 m , b = 12 m , and h = 4.5 m

Volume of the cuboid = (l ×b × h)

= (15 × 12 × 4.5)

= 810 m^3

Total surface area of cuboid = 2(lb + bh + lh)

= 2 (15 × 12 +12 × 4.5 +15 × 4.5)

= 603m^2

Lateral surface area of the cuboid

=[2 (l + b) × h]

=[2 (15 + 12) × 4.5]

= 243 m^2

Q.13). How many bricks will be required to construct a wall 13.5 m long , 6 m high and 22.5 cm thick? It is being given that each brick measure [27 cm × 12-5 cm ×9cm)

Solution:

Length of the wall = (13.5 × 100) = 1350 cm

Breath of the wall = 22.5 cm

Height of the wall = (6 × 100) = 600 cm

Volume of the wall = (1350 × 22.5 × 600) cm^3

Volume of each brick = (27× 12.5 × 9) cm^3

Number of bricks required

$$= \frac{\text{volume of the wall}}{\text{valume of the brick}}$$

$$= \frac{1350 \times 22.5 \times 600}{27 \times 12.5 \times 9}$$

= 6000

Q.14). A room is 16 m long ,9 m wide and 3m high It has two doors each of dimension (2m × 1.5m) And three windows, each of dimension (1.6m ×7.5cm) find the cost of distempering the walls of the room from inside at the rate of rs. 50 per sq.m

Solution:

Area of 4 walls of the room = [2 (l + b) ×h]

=[2 (16 + 9) × 3]

= 150 m^2

Area of 2 doors = [2 × (2 × $\frac{3}{2}$)]

= 6m^2

Area of 3 windows = [3× (1.6 × $\frac{7.5}{100}$)]

= $\frac{18}{5}$

= 3.6 m^2

Area not to be distempered = (6 + 3.6) m^2

= 9.6 m^2

Area to be distempered = (150 – 9.6)

= 140.4 m^2

Cost of distempering the walls = (140.4 × 50)

= Rs.7020

Q.15). A plastic box 1.5 m long 1.25 m wide and 65 cm Deep is to be made. it is opened at the top ignoring the thickness of the plastic sheet determine.

(i)The area of the sheet required for making the box

(ii)The cost of sheet for it ,if a sheet measuring $1m^2$ Costs rs.20

Solution:

(i) Here l = 1.5 m b = 1.25 m

H = 65 cm $\frac{65}{100}$ = 0.65 m

∴ It is open from the top

∴ Its surface area = Lateral surface area +base area

= [2(l + b) h] + (l × b)

= [2(1.50 + 1.25) 0.65] + (1.50 × 1.25)

= [2×2.75 × 0.65] × [1.875]

= 3.575+1.875

= 5.45 m^2

Total surface area of the box = 5.45 m^2

∴ Area of sheet required for making the box = 5.45 m^2

(ii) Rate of sheet = Rs.20 per m^2

∴ cost of 5.45 m^2 = rs.20 × 5.45

= rs.20 × $\frac{5.45}{100}$

= $Rs.109$

∴ cost of required sheet = Rs.109.

Q.16). The floor of a rectangular hall has a perimeter 250 m .If The cost of painting the four walls at the rate of rs.10 Per m^2 is rs 15,000, find the height of the wall.

Solution:

Area of four walls = lateral surface area

A rectangular hall means a cuboid .

Let the length and breath of the hall be l and b respectively

∴ perimeter of the floor = 2 (l +b)

= 250 m

∴Area of four walls = lateral surface area

= [2 (l +b)] ×h (h is height of hall)

∴ cost of painting the four walls = Rs.10 × 250 h

= Rs.2500 h

Rs.2500 h = Rs. 15000 h

h = $\frac{15000}{2500}$ = 6

∴ The required height of the hall = 6 m

Q.17). Curved surface area of cone is 4070 cm^2 and the diameter of base is 70 cm find slant height of the Cone.

Solution:

Radius of the cone = $\frac{\text{Diameter}}{2} = \frac{70}{2}$ = 35 cm

Curved surface area of cone = πrl

$\therefore\ \pi rl$ = 4070

$\therefore \frac{22}{7} \times 35 \times l$ =4070

$\therefore 22 \times 5 \times l$ =4070

$\therefore l = \frac{4070}{22\times5}$

$\therefore l = \frac{814}{22}$ = 37 cm

Slant height of the cone is 37 cm

Q.18) Two cones are of same height and ratio of their radii is 2:3find the ratio of their volume.

Solution :

Height (h) of both the cones is same

Ratio of their radii $r_1 : r_2$= 2:3

Let x be the common multiple

$\therefore r_1$= 2x and r_2 =3x

v_1 = volume of first cone = $= \frac{1}{3}\pi r_1 2_h$

v_2 = volume of second cone = $\frac{1}{3}\pi r_2 2_h$

∴ Ratio of their volumes

$$\frac{v_1}{v_2} = \frac{\frac{1}{3}\pi r {r_1}^2 h}{\frac{1}{3}\pi {r_2}^2 h} = \frac{\frac{1}{3}\pi (2x)^2 h}{\frac{1}{3}\pi (3x)^2 h}$$

$$= \frac{(2x)^2}{(3x)^2} = \frac{4x^2}{9x^2} = \frac{4}{9}$$

The ratio of the volume of two cones is $v_1 : v_2 = 4:9$

Q.19) A tent of radius 3.5 m with a slant height 12 m is to be prepared .find the canvas sheet required to construct this tent.

Solution :

The canvas sheet required to construct the tent is the Curved surface area of this tent .

∴ curved surface area of the tent = $\pi\, rl$

$= \frac{22}{7} \times 3.5 \times 15$

$= 22. \times 0.5 \times 12$

$= 132\ m^2$

∴ canvas required to construct the tent is $132\ m^2$

Q.20) Volume of cone is 1004.8 m^3 and its radius is 8 m. find the slant height of the cone (π = 3.14)

Solution : Volume of the cone = $\frac{1}{3}\pi r^2\ h$

$\therefore 1004.8 = \frac{1}{3} \times 3.14 \times 8 \times 8 \times h$

$\therefore h = \frac{1004.8 \times 3}{3.14 \times 8 \times 8} = \frac{1004.8 \times 3 \times 10}{314 \times 8 \times 8}$

$\therefore h = 15$ m

Now r =8m, h = 15m, l = ?

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

$=(8)^2 + (15)^2$

$= 64 + 225$

$= 289$

$l = 17$ m

Slant height of the cone is 17 m

Q.21). The cylinder and radius of cone and height are equal . Volume of cylinder 900 c. cm. then find the volume of Cone.

Solution :

Equal radius and height, volume of cylinder is three times of volume of cone

$\therefore$ volume of cylinder $= 3 \times$ volume of cone

$\therefore 900 = 3 \times$ volume of cone

$\frac{900}{3}$ = volume of cone

$\therefore$ volume of cone =300 c.cm

$\therefore$ volume of cone is 300 c.cm

Q.22) Radius of a sphere is 4.2 cm .find its volume and surface area.

Solution:

Radius of sphere (r) = 4.2 cm

Volume of sphere $= \frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \frac{22}{7} \times 4.2 \times 4.2 \times 4.2$

$= 4 \times 22 \times 0.2 \times 4.2 \times 4.2$

$= 310.464\ cm^3$

Surface area of the sphere $= 4\pi r^2$

$= 4 \times \frac{22}{7} \times 4.2 \times 4.2$

$= 4 \times 22 \times 0.6 \times 4.2$

$= 221.76\ cm^2$

Q.23).The ratio of volumes of two sphere is 27:64 If the sum Of their radii is 28 cm, find the radius of each.

Solution : The ratio of volume of two sphere is 27:64 suppose,

Radius of sphere are r_1 and r_2 respectively.

$\therefore \quad \frac{\frac{4}{3}\pi {r_1}^3}{\frac{4}{3}\pi {r_2}^3} = \frac{27}{64}$

$\therefore \quad \frac{{r_1}^3}{{r_2}^3} = \frac{27}{64}$

$\therefore \quad \frac{r_1}{r_2} = \frac{3}{4}$

$4r_1 = 3r_2$ ... ----------(i)

But, $r_1 + r_2 = 28$

$r_2 = 28 - r_1$

$r_2 = 28 - r_1$ (this value put in (i))

$4r_1 = 3r_2$ ...

$4r_1 = 3(28 - r_1)$

$4r_1 = 84 - 3r_1$

$7r_1 = 84$

$r_1 = 12$

$\therefore r_2 = 28 - r_1 = 28 - 12 = 16$

$\therefore r_1 = 12$ cm and $r_2 = 16$cm

∴ radius of sphere are 12 cm and 16 cm respectively

Q.24). Surface area of a sphere is 616 cm^2.find the volume of this sphere . ($\pi = \frac{22}{7}$)

Solution :

If 'r ' is the radius of sphere, then surface area of

Sphere = $4\pi r^2$

$\therefore 4\pi r^2 = 616$

$\therefore \quad 4\times \frac{22}{7} \times r^2 = 616$

$\therefore r^2 = \frac{616\times 7}{22\times 4}$

$\therefore r^2 = \frac{88\times 7\times 7}{88}$

$\therefore r^2 = 49$

$\therefore r = 7$ cm

Volume of the sphere $= \frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \frac{22}{7} \times 7 \times 7 \times 7$

$= \frac{4312}{3}$

$= 1437.33\ cm^3$

$\therefore$ volume of the sphere is $1437.33\ cm^3$

Q.25). Radius of cone and its height are equal radius of hemisphere. If volume of hemisphere is 12.22 cm^3 then find the volume of the cone.

Solution:

Radius of hemisphere = 2 × volume of cone

$\therefore$ 12.22 = 2× volume of cone

$\therefore \frac{12.22}{2}$ = volume of cone

$\therefore$ volume of cone is $6.11\ cm^3$

Q.26). Radius of hemisphere is 3-5 cm. find the curved surface Area and total surface area of the hemisphere.

Solution:

Radius r 3.5 cm

Curved surface area of hemisphere = $2\ \pi r^2$

$= 2 \times \frac{22}{7} \times 3.5 \times 3.5$

$= 2 \times 22 \times 0.5 \times 3.5$

$= 77\ \text{cm}^2$

Total surface area of the hemisphere

$= 3\ \pi r^2$

$= 3 \times \frac{22}{7} \times 3.5 \times 3.5$

$= 115.5\ \text{cm}^2$

Q.27). The curved surface area of right circular cylinder of height 14 cm is 88 cm^2.find the diameter of the base of the cylinder.

Solution:

Let r be the radius of the cylinder here,

Height (h) = 14 cm

and curved surface area = $88cm^2$

$\therefore$ curved surface area of a cylinder = $2\pi rh$

$\therefore 2\pi rh = 88$

$\therefore 2 \times \frac{22}{7} \times r \times 14 = 88$

$\therefore r = \frac{88 \times 7}{2 \times 22 \times 14} = 1$ cm

Diameter = $2 \times r = 2 \times 1 = 2$ cm

Q.28) An open wooden box 80 cm long, 65cm wide and 45cm high is made of 2.5 cm thick wood .find

(i) The capacity of the box (ii) Weight of the box

Solution:

External length of the box = 80 cm

External breath of the box = 65 cm

External height of the box = 45 cm

External volume of the box = (80×65×45)

= 234000 cm^3

Internal length of the box = [80- (2.5 × 2)]

= 80-5

= 75 cm

Internal length of the box = [65 - (2.5 × 2)]

= 65 -5

= 60 cm

Internal height of the box = (45-2.5)

= 42.5 cm

(i)Capacity of the box = internal volume of the box

= (75× 60 × 42.5)

=191250 cm^3

(ii)Volume of wood = external volume – internal volume

= 234000 - 191250

= 42750 cm^3

Q.29) Find the volume total surface area lateral surface area and the length of diagonal of a cube , each of whose edges measure 20 cm

Solution : Here a = 20 cm

Volume of the cube = a^3

= 20 × 20 × 20

= 8000 cm^3

Total surface area of the cube = 6 q^2

= 6 × 20 × 20

= 2400 cm^2

Lateral surface area of the cube = 4 q^2

= 4 × 20 × 20

= 1600 cm^2

Diagonal of the cube = ($\sqrt{3}q$) units

= $\sqrt{3}$ × 20

= 1.732 × 20

= 34.64 cm

Q.30) How many square sheet of coloured paper of side 30 cm would be required to cover a wooden box having length ,breath and height as 90 cm, 60 cm and 30 cm respectively.

Solution: Clearly the quantity of paper required would be equal To the total surface area of the wooden box ,which is In the shape of cuboid .

The dimension of the box are

Length =90 cm breath =60 cm and height =30cm

The total surface area of the box = 2 $(lb + bh + lh)$

= 2 [(90× 60) +(60 × 30) + (90× 30)]

= 2 × (5400 +1800+2700)

= 2 × 9900

= 19800 cm^2

The area of each sheet of paper = (30 × 30)

= 900 cm^2

Number of sheets required

$$= \frac{\text{Total surface area of the box}}{\text{Area of one sheet of paper}}$$

$$= \frac{19800}{900}$$

= 22

Q.31) A cubical box has each edge 10 cm and another cuboidal box is 12.5 cm long ,10 cm wide and 8 cm high

(i)Which box has the greater lateral surface area and by how much ?

(ii) Which box has the smaller total surface area and how much ?

solution:

(i)Lateral surface area of the cubical box

$= 4\,(\text{edge})^2$

$= 4 \times 10 \times 10$

$= 400\ \text{cm}^2$

Lateral surface area of the cuboidal box

$=2\,(\text{length} + \text{breath}) \times \text{height}$

$=2\,(1.25 + 10) \times 8$

$= 2 \times 22.5 \times 8$

$= 360\ \text{cm}^2$

Difference in lateral surface areas

$= 400 - 360$

$= 40\ \text{cm}^2$

Hence the lateral surface area of the cubical box is larger than that of the cuboidal box by $40\ \text{cm}^2$

(ii) Total surface area of the cubical box

$= 6\,(\text{edge})^2$

$= 6 \times 10 \times 10$

$= 600\ \text{cm}^2$

Total surface area of the cuboidal box

$= 2\,(lb + bh + lh)$

$= 2 (12.5 \times 10 + 10 \times 8 + 12.5 \times 8)$

$= 2 (125 + 80 + 100)$

$= 2 \times 305$

$= 610 \text{ cm}^2$

Difference in total surface areas = 610 -600

$= 10 \text{ cm}^2$

Hence the total surface area of the cubical box is smaller than that of the cuboidal box by 10 cm^2

Q.32) A river 3 m deep and 40 m wide is flowing into the sea at the rate of 2 km per hour, how much water fall into the sea in a minute ?

Solution :

Width of the river = 40 m

Depth of the river = 3 m

Length of water that falls into the sea in a minute

$= \frac{2000}{60} = \frac{100}{3}$ m

Volume of water that falls into the sea in a minute

= (length × width × depth)

$= \frac{100}{3} \times 40 \times 3$

$= 4000 \text{ m}^3$

Q.33) The length of cold water storage is double its breath and its height is 3 m .If the area of its four walls be 108 cm^2 Find the volume.

Solution :

Let the breath of the cold water storage be x m then,

Its length = 2x m and height = 3 m.

Area of the four walls of the cold storage

= 2 (l + b) × h

= 2 (2x+ 3) × 3

= (18 x) m^2

But, area of 4 walls = 108 m^2

18 x = 108

$x = \frac{108}{18}$

x = 6

Breath = 6 m and length = 12 m

Volume of the cold storage = (l × b ×h)

= (12 × 6 ×3)

= 216 m^3

Q.34). It is required to make a closed cylindrical tank of height 1m and base diameter 140 cm from a metal sheet. How many square meter of the sheet are required for the same?

Solution :

Here height (h) = 1 m

∴ Diameter of the base = 140 cm = 1.40 m

∴ Radius (r) = $\frac{1.40}{2}$ =0.70 m

Total surface area of the cylinder = $2\pi r$ (h + r)

=2 × $\frac{22}{7}$ ×0.70 (1 + 0.70)

=2 × 22 ×0.10 (1.70)

= $2 \times 22 \times \frac{10}{100} \times \frac{170}{100}$

= $44 \times \frac{17}{100}$

= $\frac{748}{100}$

= 7.48 m^2

Q.35) A metal pipe is77 cm long. The inner diameter of a Cross section is 4 cm, the outer diameter being 4.4 cm find its

i) Inner curved surface area ii) Outer curved surface area

solution: Length of the metal pipe = 77 cm

It is in the form of a cylinder .

Inner diameter = 4 cm

Inner radius (r) $= \frac{4}{2} = 2$ cm

Outer diameter = 4.4 cm

Outer radius (R) $= \frac{4.4}{2} = 2.2$ cm

(i) Curved surface area = $2\pi r$h

$=2 \times \frac{22}{7} \times 2 \times 77$

$= 2 \times 22 \times 2 \times 77$

$= 2 \times 22 \times 2 \times 11$

$= 968$ cm^2

(ii) outer curved surface area = $2\pi r$h

$= 2 \times \frac{22}{7} \times 2.2 \times 7$

$= \frac{2 \times 22 \times 2 \times 11}{10}$

$= \frac{10648}{10}$

$= 1064.8$ cm^2

Q.36). Find the surface area of a sphere of radius 10.5 cm.

Solution : Here $r = 10.5$ cm

$\therefore$ Surface area of the sphere = $4\pi r^2$

$= 4 \times \frac{22}{7} \times \frac{105}{10} \times \frac{105}{10}$

$= 22 \times 3 \times 21$

$= 1386$ cm^2

Q.37) Find the total surface area of a hemisphere of radius 10 cm

Solution : Here r = 10 cm

∴ Surface area = $4\pi r^2$

Curved surface area $= \frac{4\pi r^2}{2} = 2\,\pi r^2$

$= 2 \times 3.14 \times (10)^2$

$= 2 \times \frac{314}{100} \times 10 \times 10$

$= 2 \times 314$

$= 628\ cm^2$

Plane surface area of the hemisphere = πr^2

$= 3.14 \times (10)^2$

$= \frac{314}{100} \times 10 \times 10$

$= 314\ cm^2$

∴ Total surface area = 628 +314

$= 942\ cm^2$

Q.38) Find the total surface area of a cone, if its slant height is 21 cm and diameter of its base is 24 m

Solution : Here Diameter = 24 m

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

Slant height (l) = 21 m

∴ Total surface area = $\pi r\ (r + l)$

= $\frac{22}{7} \times 12\ (12 + 21)$

= $\frac{22}{7} \times 12\ (33)$

= $\frac{22}{7} \times 12 \times\ (33)$

= $\frac{8712}{7}$

= 1244.57 m^2

Q.39) Diameter of the base of a cone is 10.5 cm and its slant height is 10 cm, find its curved surface area.

Solution: Here, diameter of the base = 10.5 cm

Radius (r) = $\frac{10.5}{2}$ cm

Slant height (l) = 10 cm

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

= $\frac{22}{7} \times \frac{10.5}{2} \times\ 10$

= $\frac{22}{7} \times \frac{10.5}{20} \times\ 10$

= 11 × 15 × 1

= 165 cm^2

Q.40) Find the radius of a sphere whose surface area is 154 cm^2

Solution :

Let the radius of the sphere be 'r' cm

$\therefore$ surface area = $4\pi r^2$

$\therefore 4\pi r^2 = 154$

$4 \times \frac{22}{7} \times r^2 = 154$

$r^2 = \frac{154 \times 7}{4 \times 22}$

$= \frac{7 \times 7}{4}$

$= (\frac{7}{2})^2$ cm

$r = \frac{7}{2}$

$r = 3.5$ cm

The required radius of a sphere is 3.5 cm.

Q.41) The curved surface area of a right circular cylinder of height 14 cm is 88 cm^2.find the diameter of the base of the cylinder.

Solution :

Let the radius of the base of the cylinder be r cm

h = 14 cm

∴ curved surface area = 88 cm^2_____(Given)

$2\pi rh = 88$

$2 \times \frac{22}{7} \times r \times 14 = 88$

$r = \frac{88 \times 7}{2 \times 22 \times 14}$

$r = 1$

$2r = 2$

Hence ,the diameter of the base of the cylinder is 2 cm.

Q.42) The inner diameter of a circular well is 3.5m .It is 10 m deep .find its inner curved surface area .

Solution: $2r = 3.5$ m

$r = \frac{3.5}{2}$ m

$r = 1.75$ m

h = 10 m

∴ Inner curved surface area of the circular well

$= 2\pi rh$

$= 2 \times \frac{22}{7} \times 1.75 \times 10$

$= 110\ m^2$

Q.43) Curved surface area of a cone is 308 cm^2 and its slant height is 14 cm. find the radius of the base.

Solution:

Slant height (l) = 14 cm

Curved surface area = 308 cm^2

πrl = 308

$\frac{22}{7} \times r \times 14 = 308$

$r = \frac{308 \times 7}{22 \times 14}$

r = 7 cm

Radius of the base is 7 cm

Q.44) The ice cream cone of slant height 12 cm is 113.04 cm^2

Find the base radius and height of the cone (π= 3.14)

Solution : Let the bade radius and height of the cone be 'r' cm and 'h' cm respectively

Then ,

πrl = 113.04

$3.14 \times r \times 12 = 113.04$

r = 3 cm

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

$(12)^2 = 3^2 + h^2$

$144 = 9 + h^2$

$h^2 = 135$

$h = \sqrt{135}$

$h = 3\sqrt{15}$ cm

Q.45) Find the surface area of a sphere of diameter 21 cm.

Solution:

Diameter = 21 cm

∴ Radius (r) = $\frac{21}{2}$ cm

∴ Surface area = $4\pi r^2$

= $4 \times \frac{22}{7} \times (\frac{21}{2})^2$

= 1386 cm^2

Q.46.) Total surface area of a cube is 3300 sq.cm find the Surface area of all vertical faces of the cube .complete the following activity.

i)Total surface area of cube = ☐

l^2 = ☐

ii) Area of vertical faces of cube = ☐

= ☐

Solution :

i) Total surface area of cube = $\boxed{6l^2}$

$\therefore 3300 = 6l^2$

$\therefore \frac{3300}{6} = l^2$

$\therefore l^2 \boxed{= 550}$

ii) Area of vertical faces of cube = $\boxed{4l^2}$

$= 4 \times 550$

$= \boxed{2200 sq.cm}$

Q.47) Radius of base of a cylinder is 22 cm and its height is 18 cm .complete the following activity to find the total Surface area ($\pi = 3.14$)

Total surface area of cylinder

$= 2\pi r$ $\square$ (formula)

$= 2 \times 3.14 \times 22$ $\square$

$= 2 \times 3.14 \times 22 \times$ $\square$

$=$ $\square$ sq.cm

Solution :

Total surface area of cylinder

$= 2\pi r \boxed{(r + h)}$

$= 2 \times 3.14 \times 22$ $\boxed{22 + 18}$

$= 2 \times 3.14 \times 22 \times \boxed{40}$

$= \boxed{5526.4}$ sq.cm

Q.48) Perpendicular height of cone is 40 cm and its slant height is 41 cm. find the radius of the base of the cone.

$l^2 = \square$ ……..(formula)

$\therefore$ $1681 = \square$

$r^2 = \square$

$r = \square$ cm.

Solution:

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

$41^2 = r^2 + 40^2$

$1681 = \boxed{r^2 + 1600}$

$r^2 = \boxed{81}$

$r = \boxed{9}$ cm

Q.49) Volume of a hemisphere is 2250 π cubic cm. find its radius.

Solution :

Given , volume of hemisphere = 2250 π cubic cm.

$\therefore \frac{2}{3}\pi r^3 = \square$

$\therefore \frac{2}{3} r^3 = \square$

$\therefore r^3 = \square$

$\therefore r = \square$ cm

Solution:

Given, volume of hemisphere = 2250π cubic cm.

$\therefore \frac{2}{3}\pi r^3 = \boxed{2250\pi}$

$\therefore \frac{2}{3} r^3 = \boxed{2250}$

$\therefore r^3 = \boxed{\frac{2250\times 3}{2}}$

$\therefore r^3 = \boxed{3375}$

$\therefore r = \boxed{\sqrt[3]{3375}}$

$\therefore r = \boxed{15}$ cm

Q.50) Total surface area of a cube is 726 sq cm find its Volume

i)Given, Total surface area of cube = 726 sq.cm

$\therefore \square = 726$

$\therefore \quad l^2 = \square$

$\therefore \quad l = \square$ cm

ii) Volume of cube $= l^3$

$= \square$ *cubic* cm.

Solution :

i)Given, Total surface area of cube = 726 sq.cm

$\therefore \quad \boxed{6l^2} = 726$

$\therefore \quad l^2 = \boxed{\frac{726}{6}}$

$\therefore \quad l = \boxed{121}$ cm

$\therefore \quad l = 11$

ii) Volume of cube $= l^3$

$= 11^3$