MATHS

BOOKS - ICSE

SURFACE AREA, VOLUME AND CAPACITY.

Example

1. The length breadth and height of a cuboid are in the ratio 6: 5: 4 if its volume is

$15,000 cm^3$ find

(ii) its dimensions

(iii) its surface area.

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2. The total surface area of a cube is $294 cm^2$

find its volume

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3. A rectangular solid of metal has dimensions 50 cm , 64 cm and 72 cm . It is melted and recasted into indentical cubes each with edge 4 cm , find the number of cubes formed

4. Three cubes , each of edge 8 cm , are joined as shown alongside . Find the total surface area and the volume of the cuboid.

5. The internal length, breadth and height of a rectangular room are 6 m 5.2 m and 4.5 m respectively . It has two doors each of 1.2 m by 2m and three windows each of 1 m by 80 cm. Find the total internal area of the room to be whitewashed.

Also find the cost of whitewashing the room (excluding the doors and windows) at the rate of rupes 6 per m^2

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6. The external length , breadth , and height of a clossed wooden bax are 30 cm , 18 cm 20 cm respectively .if the walls of the box are 1.5 cm thick , find:

(i) Capacity of the box.

(ii) volume of the wood used in making the box.

(iii) weight of the box , if 1 cm ^{3} of the wood weight 0.80 g

7. The curved surface area of a cyclinder is $17,600cm^2$ and the circumference of its base is 220 cm Find :

(i) the height of the cyclinder

(ii) the volume of the cyclinder.

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8. Find the length of the longest rod that can be placed in a small box with length 20 cm , breadth 20 cm and height =10 cm

9. The total surface area of a cyclinder of diameter 10 cm is $330 cm^2$ Find the height of the cyclinder.

10. How many 3 cm cubes can be cut from a cuboid measuring $18 \times 12 cm \times 9 cm$?

11. A rectangular sheet of paper $44cm \times 18cm$ is rolled along its length and a cycllinder is formed. Find the radius and the volume of the cyclinder formed.

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1. Find the volume and the total surface area of a cuboid ,whose :

length = 15 cm , breadth = 10 cm and height = 8 cm

2. Find the volume and the total surface area of a cuboid ,whose :

l = 3.5 m, b = 2.6 m and h = 90 cm .

3. The volume of a cuboid is $7.68m^3$ if its length = 3.2 m and height = 1.0 m find its breadth.

4. The volume of a cuboid is $7.68m^3$ if its length =3.2 m and height = 1.0 m : find its breadth.

5. The breadth and heigth of a rectangular solid are 1.20 m and 80 cm respectively if the volume of the cuboid is $1.92m^3$ find its length.

6. The length the breadth and the height of a cuboid are in the ratio 5: 3: 2 If its volume is $240cm^3$ find its dimensions. Also find the total surface area of the cuboid.

7. The length breadth and height of a cuboid are in the ratio 6: 5: 3 If its total surface area is $504cm^2$, find its dimmension . Also find the volume of the cuboid.

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8. Find the volume and total surface area of a cube whose each edge is:

8 cm

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9. Find the volume and total surface area of a cube whose each edge is:

2m 40 cm.

10. Find the length of each edge of a cube. If its volume is

$216cm^3$

(ii) $1.728m^3$

11. The total surface area of cube is $216 cm^2$

Find its volume.

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12. A solid cuboid metal has dimensions 24cm .

18 cm and 4cm Find the volume.

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13. A wall 9 m long. 6m high and 20 cm thick is to be constructed using bricks of dimensions 30 cm. 15m and 10 cm . How many bricks will be required.?

14. A solid cube of edge 14 cm is melted down and recast into smaller and equal cubes each of edge 2 cm . Find the number of smaller cubes obtained.
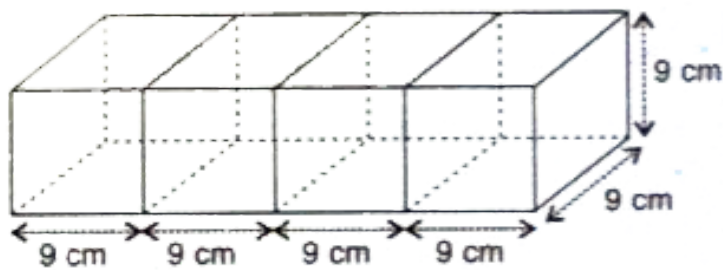
15. A closed box is a cuboid in shape with length = 40 cm , breadth = 30 cm and height = 50 cm , It is made of thin metal sheet. Find the cost of metal sheets required to make 20 such boxes. If $1m^2$ of metal sheet costs rupes 45.

16. Four cubes ,each of edge 9 cm . Are joined as shown below.

9 cm
9 cm
9 cm 9 cm 9 cm 9 cm

Write the dimesions of the cuboid obtained

Also, find total surface area and volume.

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Exercise B

1. How many persons can be accommodated in

a big - hall of dimensions 40 m . 25m and 15 m.

Assuming that each person requires $5m^3$ of air?

2. The dimensions of a class- room are length = 15 m. breadth =12m and height 7.5 m Find . How many children can be accommodated in this class - room assuming $3.6m^3$ of air is needed for each child.

3. The length , breadth and height of a room are $6m$, $5.4m$ and $4m$ respectively . Find the area of (i) its four walls. (ii) its roof

4. A room 5 m long 4.5 m wide and 3.6m high has one door 1.5 m by 2.4m and two windows each 1m by 0.75m . Find:

(i) the area of its walls ,excluding door and windows.

(ii) the cost of distempering its walls at the

rate of rupees 4.50 $perm^2$

(iii) The cost of painting its roof at the rate of rupees 9 per m^2

5. The dining hall of a hotel is 75 m . Long 60m broad and 16 m high It has five doors 4m by 3 m each and four windows 3 m by 1.6 m each. Find the cost of:

(i) papering its walls at the rate of rupees 12 per m^2

(ii) Carpeting its floor at the rate of rupees 25 per m^2

6. Find the volume of wood required to make a closed box of external dimensions , 80 cm 75 cm and 60 cm the thickness of walls of the box being 2 cm throughout.

7. A closed box measures 66 cm , 36 cm and 21 cm from outside. It its walls are made of metal-sheet 0.5 cm thick find

the capacity of the box.

(ii) volume of metal sheet and

(iii) weight of the box. If $1cm^3$ of metal weigth $3.6g$.

8. The internal length , breadth and height of a closed box are 1 m , 80 cm and 25 cm respectively . If its sides are made of 2.5 cm thick wood , find

the capacity of the box

(ii) the volume of wood used to make the box.

9. Find the area of metal - sheet required to make an open tank of length = 10 m breadth =

7.5 m and depth = 3.8 m.

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10. A tank 30 m long. 24 m wide and 4.5 m deep is to be made. It is open from the top. Find the cost of iron- sheet required at the rate of rupes 65 per m^2. To make the tank.

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Exercise C

1. The edges of three solid cubes are 6cm , 8cm and 10 cm These cubes are melted and recasted into a single cube. Find the edge of the resulting cube.

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2. Three solid cubes of edges 6 cm , 10 cm and x cm are melted to form a single cube of edge 12 cm. Find the value of x.

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3. The length of the diagonal of a cube is $8\sqrt{3}$

cm . Find its

edge

(ii) total surface

(iii) volume

4. A cube of edge 6 cm and a cuboid with

dimensions $4cm \times xcm \times 15cm$ are equals in

volume . Find :

(i) the value of x

(ii) total surface area of the cuboid

(iii) total surface area of the cube.

Which of these two has greater surface and by how much?

5. The capacity of a rectangular tank is $5.2 cm^3$ and the area of its base is $2.6 \times 10^4 cm^2$ find its height (depth).

6. The height of a rectangular solid is 5 times its width and its length is 8 times its height . If the volume of the walls is $102.\,4cm^3$, find its length

7. The ratio between the lengths of the edges of two cubes are in the ratio 3: 2 Find the ratio between their :

total surface area

(ii) volume.

8. The length breadth and heigth of a cuboid (rectangular solid) are 4: 3: 2

(i) If its surface area is $2548cm^2$ find its volume.

(ii) If its volume is $3000m^3$, find its surface area.

1. The height of a circular cyclinder is 20 cm and the diamete rof its bases is 4cm . Find :

its volume

(ii) its total surface area

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2. Find the curved surface area and the total surface area of a right circular cyclinder whose

height is 15 cm and the diameter of the cross-
sections is 14 cm

3. Find the height of the cyclinder whose radius is 7 cm and the total surface are is $1100cm^2$

4. The curved surface area of cyclinder of height 14 cm is $88cm^2$. Find the diameter of the base of the cyclinder.

5. The ratio between the curved surface area and the total surface area of a cyclinder is 1: 2 Find the ratio between the height and the radius of the cyclinder.

6. Find the capacity of a cyclinder container with internal diameter 28 cm and height 20 cm.

7. The total surface area of a cyclinder is $6512cm^2$ and the circumference of its base is 88 cm Find

(i) its radius

(ii) its volume.

8. The sum of the radius and the height of a cyclinder is 37 cm and the total surface area of the cyclinder is $1628cm^2$. Find the height and the volume of the cyclinder.

9. A cyclindrical pillar has radius 21 cm and height 4m . Find

(i) the curved surface area of the pilar

(ii) cost of poilshing 36 such cyclindrical pillars

at the rate of rupes 12 per m^2.

10. If the radii of two cyclinders are in the ratio

4: 3 and their heights are in the ratio 5: 6 find

the ratio of their curved surface.

1. A cuboid is 8 m long . 12 m broad and 3.5 m

high. Find its

total surface area.

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2. A cuboid is 8 m long . 12 m broad and 3.5 m

high. Find its

lateral surface area.

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3. How many bricks will be required for constructing a wall which is 16 cm long . 3 m high and 22.5 cm thick , if each bricks measures $25cm \times 11.25cm \times 6$ cm ?

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4. The length breadth and height of cuboid are in the ratio 6: 5: 3 if its total surface area is $504cm^2$ find its volume.

5. The external dimensions of an open wooden box are $65cm$, $34cm$ and $25cm$ If the box is made up of wood 2 cm thick , find the capacity of the box and the volume of wood used to make it.

6. The curved surface area and the volume of a toy . Cyclinder in shape . Are $132cm^2$ and

$462 cm^3$ respectively . Find its diameter and its length.

7. The floor of a rectangular hall has a perimeter 250 m . If the cost of painting the four walls at the rate of rupes 10 per m^2 is rupes 15,000 , find the height of the hall.

8. The length of a hall is double its breadth , its height is 3 m . The area of its four walls. (including doores and windows) is $108m^2$. Find its volume.

9. A solid cube of side 12 cm is out into 8 identical cubes. What will be the side of the new cube ? Also . Find the ratio between the

surface area of the original cube and the total

surface area of all the small cubes formed.

10. The diameter of a garden roller is 1.4 m and

it is 2m long . Find the maximum area covered

by it in 50 revolutions?

11. In a building , there are 24 cyclinder pillars , For each pillar , radius is 28 cm and height is 4m . Find the total cost to painting the curved surface area of the pillars at the rate of 8 per m^2

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