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1. Find the volume of a cuboid whose
(i) length = 12 cm, breadth = 8 cm, height = 6 cm
(ii) length = 1.2 m, breadth = 30 cm, height = 15 cm
(iii) length = 15 cm, breadth = 2.5 dm, height = 8 cm.
Solution:
(i) The given details are:
Length of a cuboid = 12 cm
Breadth of a cuboid = 8 cm
Height of a cuboid = 6 cm
By using the formula
Volume of a cuboid = length × breadth × height
= 12 × 8 ×6
= 576 cm^3

(ii) The given details are:
Length of a cuboid = 1.2 m = 120 cm
Breadth of a cuboid = 30 cm
Height of a cuboid = 15 cm
By using the formula
Volume of a cuboid = length × breadth × height
= 120 × 30 × 15
= 54000 cm^3

(iii) The given details are:
Length of a cuboid = 15 cm
Breadth of a cuboid = 2.5 dm = 25 cm
Height of a cuboid = 8 cm
By using the formula
Volume of a cuboid = length × breadth × height
= 15 × 25 × 8
= 3000 cm^3

2. Find the volume of a cube whose side is
(i) 4 cm (ii) 8 cm
(iii) 1.5 dm (iv) 1.2 m
(v) 25 mm
Solution:

(i) Given details are,
Side of cube = 4 cm
Volume of cube = $(\text{side})^3$
$= 4^3 = 64\ \text{cm}^3$

(ii) Given details are,
Side of cube = 8 cm
Volume of cube = $(\text{side})^3$
$= 8^3 = 512\ \text{cm}^3$

(iii) Given details are,
Side of cube = 1.5 dm
Volume of cube = $(\text{side})^3$
$= 1.5^3 = 3.375\ \text{dm}^3 = 3375\ \text{cm}^3$

(iv) Given details are,
Side of cube = 1.2 m
Volume of cube = $(\text{side})^3$
$= 1.2^3 = 1.728\ \text{m}^3$

(v) Given details are,
Side of cube = 25 mm
Volume of cube = $(\text{side})^3$
$= 25^3 = 15625\ \text{mm}^3 = 15.625\ \text{cm}^3$

3. Find the height of a cuboid of volume 100 cm^3, whose length and breadth are 5 cm and 4 cm respectively.
Solution:
Given details are,
Volume of a cuboid = 100 cm^3
Length of a cuboid = 5 cm
Breadth of a cuboid = 4 cm
Let height of cuboid be ‘h’ cm
We know that, $l \times b \times h = 100\text{cm}$
$h = 100/(l \times b)$
$= 100/(5\times4)$
$= 5\text{cm}$

4. A cuboidal vessel is 10 cm long and 5 cm wide. How high it must be made to hold

300 cm^3 of a liquid?

Solution:

Given details are,

Volume of a liquid in the vessel = 300 cm^3

Length of a cuboidal vessel = 10 cm

Breadth of a cuboidal vessel = 5 cm

Let height of cuboidal vessel be 'h' cm

We know that, $l \times b \times h = 300\ cm^3$

$h = 300/(l \times b)$

$= 300/(10 \times 5)$

$= 6cm$

5. A milk container is 8 cm long and 50 cm wide. What should be its height so that it can hold 4 litres of milk?

Solution:

Given details are,

Volume = 4 litres = 4000 cm^3

Length of a milk container = 8 cm

Breadth of a milk container = 50 cm

Let height of milk container be 'h' cm

We know that, $l \times b \times h = 4000\ cm^3$

$h = 4000/ (l \times b)$

$= 4000/ (50 \times 8)$

$= 10cm$

6. A cuboidal wooden block contains 36 cm^3 wood. If it be 4 cm long and 3 cm wide, find its height.

Solution:

Given details are,

Volume of wooden block = 36 cm^3

Length of the wooden block = 4 cm

Breadth of a wooden block = 3 cm

Let height of wooden block be 'h' cm

We know that, $l \times b \times h = 36\ cm^3$

$h = 36/(l \times b)$

$= 36/(4 \times 3)$

$= 3cm$

7. What will happen to the volume of a cube, if its edge is

(i) halved (ii) trebled?
Solution:
Let us consider edge of a cube be ‘a’ cm
Volume of a cube will be ‘a^3’cm
(i) When halved
Edge = a/2
Volume = $(a/2)^3 = a^3/2^3 = a^3/8$ = 1/8times

(ii) When trebled
Edge = 3a
Volume = $(3a)^3 = 27a^3$ = 27times

8. What will happen to the volume of a cuboid if its:
(i) Length is doubled, height is same and breadth is halved?
(ii) Length is doubled, height is doubled and breadth is same?
Solution:
Let us consider,
Length of a cuboid be ‘l’
Breadth of a cuboid be ‘b’
Height of a cuboid be ‘h’
So, Volume of a cuboid = l × b × h
Now,
(i) Length of a cuboid becomes = 2l
Breadth = b/2
Height = h
Volume of cuboid = 2l × b/2 × h = l × b × h (remains same)

(ii) Length of a cuboid becomes = 2l
Breadth = b
Height = 2h
Volume of cuboid = 2l × b × 2h = 4lbh (four times)

9. Three cuboids of dimensions 5 cm × 6cm × 7cm, 4cm × 7cm × 8cm and 2 cm × 3 cm × 13 cm are melted and a cube is made. Find the side of cube.
Solution:
Given details are,
Volume of First cuboid = 5 × 6 × 7 = 210 cm^3
Volume of second cuboid = 4 × 7 × 8 = 224 cm^3

Volume of third cuboid = $2 \times 3 \times 13 = 78$ cm^3
So, Volume of a cube = $210 + 224 + 78 = 512$ cm^3
Let side of a cube be 'a'
$a^3 = 512$
$\therefore a = 8$ cm

10. Find the weight of solid rectangular iron piece of size 50 cm×40cm × 10 cm, if 1 cm^3 of iron weights 8 gm.
Solution:
Given details are,
Dimension of rectangular iron piece = 50cm × 40cm × 10cm
Volume of solid rectangular = $50 \times 40 \times 10 = 20000$ cm^3
Weight of 1 cm^3 iron = 8 gm.
$\therefore$ Weight of 20000 cm^3 iron = 8×20000
= 160000 gm.
= 160 kg

11. How many wooden cubical blocks of side 25 cm can be cut from a log of wood of size 3 m by 75 cm by 50 cm, assuming that there is no wastage?
Solution:
Given details are,
Dimensions of log of wood = 3m × 75cm × 50cm
Side of cubical block = 25cm
We know that,
Number of cubical block that can be made from wooden log =
Volume of wooden block / volume of cubical block
= $(300 \times 75 \times 50) / (25 \times 25 \times 25)$
= 72 blocks

12. A cuboidal block of silver is 9 cm long, 4 cm broad and 3.5 cm in height. From it, beads of volume 1.5 cm^3 each are to be made. Find the number of beads that can be made from the block.
Solution:
Given details are,
Length of a cuboidal block of silver = 9cm
Breadth = 4cm
Height = 3.5cm
Volume of a cuboid = l × b × h
= $9 \times 4 \times 3.5 = 126cm^3$

So, Number of beads of volume $1.5cm^3$ that can be made from the block =
Volume of silver block/volume of one bead
= $126cm^3/1.5cm^3$
= 84 beads

13. Find the number of cuboidal boxes measuring 2 cm by 3 cm by 10 cm which can be stored in a carton whose dimensions are 40 cm, 36 cm, and 24 cm.
Solution:
Given details are,
Dimensions of cuboidal boxes is = 2cm × 3cm × 10 cm
Dimensions of carton is = 40cm × 36cm × 24cm
So,
Number of boxes that can be stored in carton = volume of carton / volume of one box
= (40 × 36 × 24) / (2 × 3 × 10)
= 576 cuboidal boxes

14. A cuboidal block of solid iron has dimensions 50 cm, 45 cm, and 34 cm, how many cuboids of size 5 cm by 3 cm by 2 cm can be obtained from this block? Assume cutting causes no wastage.
Solution:
Given details are,
Dimensions of cuboidal block of iron is = 50cm × 45cm × 34cm
Size of small cuboids cutting from it is = 5cm × 3cm × 2cm
So,
Number of small cuboids that can be cut =
Volume of large iron cuboid/ volume of small cuboid
= (50 × 45 × 34) / (5 × 3 × 2)
= 2550 cuboidal blocks

15. A cube A has side thrice as long as that of cube B. What is the ratio of the volume of cube A to that of cube B?
Solution:
Given details are,
Let side of cube B be ‘x’ cm
Then, side of cube A = 3x cm
So now,
Ratio = volume of cube A / volume of cube B
= $(3x)^3 / (x)^3$
= $27x^3/ x^3$ = 27/1 = 27:1

16. An ice-cream brick measures 20 cm by 10 cm by 7 cm. How many such bricks can be stored in deep fridge whose inner dimensions are 100 cm by 50 cm by 42 cm?
Solution:
Given details are,
Dimensions of ice cream brick = 20 cm × 10cm × 7cm
Dimensions of fridge is = 100 cm × 50cm × 42 cm
So,
Number of bricks that can be put in fridge = volume of fridge / volume of one ice brick
= (100 × 50 × 42) / (20 × 10 × 7)
= 150 ice cream bricks

17. Suppose that there are two cubes, having edges 2 cm and 4 cm, respectively. Find the volumes V_1 and V_2 of the cubes and compare them.
Solution:
Given details are,
Edge of one cube $a_1 = 2$ cm
Edge of second cube $a_2 = 4$ cm
So, volume $v_1 = 2^3 = 8cm^3$
Volume $v_2 = 4^3 = 64cm^3$
$v_2 = 8v_1$

18. A tea-packet measures 10 cm × 6 cm × 4 cm. How many such tea-packets can be placed in a cardboard box of dimensions 50 cm × 30cm × 0.2 m?
Solution:
Given details are,
Dimensions of tea packet = 10 cm × 6 cm × 4cm
Dimension of cardboard box = 50cm × 30cm × 0.2 m
So,
Number of tea packets can be put in cardboard box =
Volume of cardboard box / volume of tea packet
= (50 × 30 × 20) / (10 × 6 × 4)
= 125 tea packets

19. The weight of a metal block of size 5 cm by 4 cm by 3 cm is 1 kg. Find the weight of a block of the same metal of size 15 cm by 8 cm by 3 cm.
Solution:
Given details are,
Dimensions of metal block = 5cm × 4cm × 3cm

Weight of block = 1 kg
Volume of box = 5×4×3 = 60 cm^3

Dimension of new block = 15cm × 8cm × 3cm
Volume of new box = 15 × 8 × 3 = 360 cm^3
We know that,
60cm^3 = 1kg
360 cm^3 = 6 × 60 cm^3
= 6 × 1
= 6 kg

20. How many soap cakes can be placed in a box of size 56 cm × 0.4 m × 0.25 m, if the size of a soap cake is 7 cm × 5cm × 2.5 cm?
Solution:
Given details are,
Dimensions of box = 56cm × 0.4m × 0.25m
Dimensions of soap cake = 7cm × 5cm × 2.5cm
So,
Number of soap cakes that can be placed in box = volume of box / volume of soap cake
= (56 × 40 × 25) / (7 × 5 × 2.5)
= 640 soap cakes

21. The volume of a cuboidal box is 48 cm^3. If its height and length are 3 cm and 4 cm respectively, find its breadth.
Solution:
Given details are,
Volume of a cuboidal box = 48 cm^3
Length of a cuboidal box = 4 cm
Height of a cuboidal box = 3 cm
Let breadth of wooden block be ‘b’ cm
We know that, l × b × h = 48 cm^3
b = 48/(l × h)
= 48/(4×3)
= 4cm