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1.Given a cylindrical tank, in which situation will you find surface are and in which situation volume.

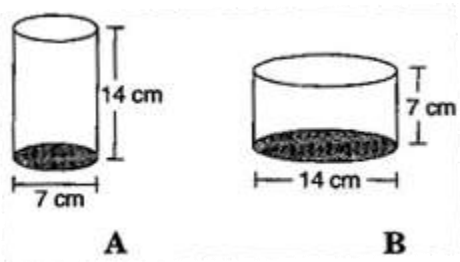
(a) To find how much it can hold.
(b) Number of cement bags required to plaster it.
(c) To find the number of smaller tanks that can be filled with water from it.

Solution: We find area when a region covered by a boundary, such as outer and inner surface area of a cylinder, a cone, a sphere and surface of wall or floor.

When the amount of space occupied by an object such as water, milk, coffee, tea, etc., then we have to find out volume of the object.

(a) Volume (b) Surface area (c) Volume

2. Diameter of cylinder A is 7 cm and the height is 14 cm. Diameter of cylinder B is 14 cm and height is 7 cm. Without doing any calculations can you suggest whose volume is greater? Verify it by finding the volume of both the cylinders. Check whether the cylinder with greater volume also has greater surface area.



Solution: Yes, we can say that volume of cylinder B is greater, since radius of cylinder B is greater than that of cylinder A.

Find Volume for cylinders A and B

Diameter of cylinder A = 7 cm

Radius of cylinder A = 7/2 cm

And Height of cylinder A = 14 cm

Volume of cylinder A = $\pi r^2 h$

= $(22/7) \times (7/2) \times (7/2) \times 14 = 539$

Volume of cylinder A is 539 cm^3

Now, Diameter of cylinder B = 14 cm

Radius of cylinder B = $14/2 = 7$ cm

And Height of cylinder B = 7 cm

Volume of cylinder B = $\pi r^2 h$

= $(22/7) \times 7 \times 7 \times 7 = 1078$

Volume of cylinder B is 1078 cm^3

Find surface area for cylinders A and B

Surface area of cylinder A = $2\pi r(r+h)$

= $2 \times 22/7 \times 7/2 \times (7/2 + 14) = 385$

Surface area of cylinder A is385 cm^2

Surface area of cylinder B = $2\pi r(r+h)$

= $2 \times (22/7) \times 7(7+7) = 616$

Surface area of cylinder B is 616 cm^2

Yes, cylinder with greater volume also has greater surface area.

3. Find the height of a cuboid whose base area is 180 cm^2 and volume is 900 cm^3?

Solution: Given, Base area of cuboid = 180 cm^2 and Volume of cuboid = 900 cm^3

We know that, Volume of cuboid = lbh

900 = 180×h (substituting the values)

h= 900/180 = 5

Hence the height of cuboid is 5 cm.

4. A cuboid is of dimensions 60 cm×54 cm×30 cm. How many small cubes with side 6 cm can be placed in the given cuboid?

Solution: Given, Length of cuboid, l = 60 cm, Breadth of cuboid, b = 54 cm and

Height of cuboid, h = 30 cm

We know that, Volume of cuboid = lbh = 60 ×54×30 = 97200 cm^3

And Volume of cube = $(Side)^3$
= 6×6×6 = 216 cm^3

Also, Number of small cubes = volume of cuboid / volume of cube

= 97200/216

= 450

Hence , required cubes are 450.

5. Find the height of the cylinder whose volume if 1.54 m^3 and diameter of the base is 140 cm.

Solution:

Given: Volume of cylinder = 1.54 $m^3$and Diameter of cylinder = 140 cm
∴ Radius (r)= d/2 = 140/2 = 70 cm

Volume of cylinder = $\pi r^2 h$

$1.54 = (22/7)\times 0.7\times 0.7\times h$

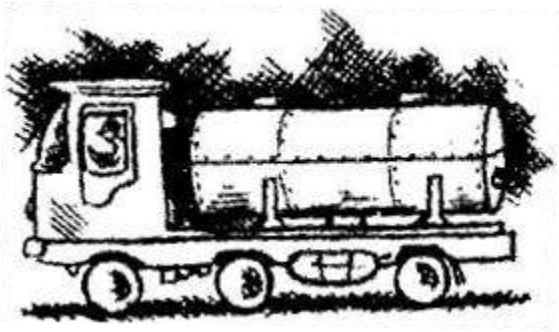
After simplifying, we get the value of h that is

$h = (1.54\times 7)/(22\times 0.7\times 0.7)$

h = 1

Hence, height of the cylinder is 1 m.

6. A milk tank is in the form of cylinder whose radius is 1.5 m and length is 7 m. Find the quantity of milk in liters that can be stored in the tank.



Solution: Given, Radius of cylindrical tank, r = 1.5 m and Height of cylindrical tank, h = 7 m

Volume of cylindrical tank, V = $\pi r^2 h$

= (22/7)×1.5×1.5 ×7

= 49.5 cm^3

= 49.5×1000 liters = 49500 liters

[∵ 1 m^3= 1000 liters]
Hence, required quantity of milk is 49500 liters.

7. If each edge of a cube is doubled,
(i) how many times will its surface area increase?
(ii) how many times will its volume increase?

Solution:(i) Let the edge of cube be " l" .

Formula for Surface area of the cube, A = 6 l^2

When edge of cube is doubled, then

Surface area of the cube, say A' = $6(2l)^2 = 6\times4l^2 = 4(6\ l^2)$

A' = 4A

Hence, surface area will increase by four times.

(ii) Volume of cube, V = l^3
When edge of cube is doubled, then

Volume of cube, say V' = $(2l)^3 = 8(\ l^3)$

V' = 8×V

Hence, volume will increase 8 times.

8. Water is pouring into a cuboidal reservoir at the rate of 60 liters per minute. If the volume of reservoir is 108 m^3, find the number of hours it will take to fill the reservoir.

Solution:

Given, volume of reservoir = 108 m^3

Rate of pouring water into cuboidal reservoir = 60 liters/minute

= 60/1000 m^3per minute

Since 1 liter = (1/1000)m^3

= (60×60)/1000 m^3 per hour

Therefore, (60×60)/1000 m^3 water filled in reservoir will take = 1 hour

Therefore 1 m^3 water filled in reservoir will take = 1000/(60×60) hours

Therefore, 108 m^3 water filled in reservoir will take = (108×1000)/(60×60) hours = 30 hours

Answer: It will take 30 hours to fill the reservoir.