



NCERT solutions for class 8 maths chapter 11 mensuration Ex-11.4

Q1. Given a cylindrical tank, in which situation will you find surface area and in which situation volume.

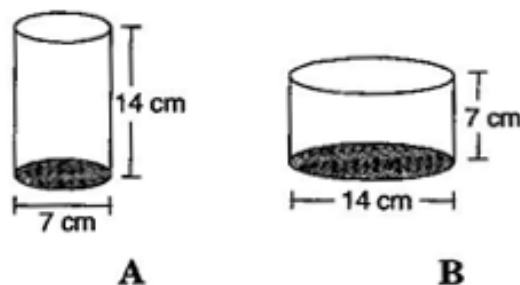
- (a) To find how much it can hold.
- (b) Number of cement bags required to plaster it.
- (c) To find the number of smaller tanks that can be filled with water from it.

Ans. 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

Q2. 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.



Ans. Yes, we can say that volume of cylinder B is greater, since radius of cylinder B is greater than that of cylinder A (and square of radius gives more value than previous).

Diameter of cylinder A = 7 cm

$$\Rightarrow \text{Radius of cylinder A} = \frac{7}{2} \text{ cm}$$

And Height of cylinder A = 14 cm

$$\therefore \text{Volume of cylinder A} = \pi r^2 h$$

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

$$= 539 \text{ cm}^3$$

Now Diameter of cylinder B = 14 cm

$$\Rightarrow \text{Radius of cylinder B} = \frac{14}{2} = 7 \text{ cm}$$

And Height of cylinder B = 7 cm

$$\therefore \text{Volume of cylinder A} = \pi r^2 h$$

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

$$= 1078 \text{ cm}^3$$

Total surface area of cylinder A

$$= \pi r(2h + r) \text{ [}\because \text{ It is open from top]}$$

$$= \frac{22}{7} \times \frac{7}{2} \left(2 \times 14 + \frac{7}{2} \right)$$

$$= 11 \times \left(28 + \frac{7}{2} \right)$$

$$= 11 \times \frac{63}{2} = 346.5 \text{ cm}^2$$

Total surface area of cylinder B

$$= \pi r(2h+r) \quad [\because \text{It is open from top}]$$

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

$$= 22 \times (14 + 7) = 22 \times 21 = 462 \text{ cm}^2$$

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

Q3. Find the height of a cuboid whose base area is 180 cm^2 and volume is 900 cm^3 ?

Ans. Given: Base area of cuboid = 180 cm^2 and
Volume of cuboid = 900 cm^3

We know that,

$$\text{Volume of cuboid} = l \times b \times h$$

$$\Rightarrow 900 = 180 \times h \quad [\because \text{Base area} = l \times b = 180 (\text{given})]$$

$$\Rightarrow h = \frac{900}{180} = 5 \text{ m}$$

Hence the height of cuboid is 5 m.

Q4. A cuboid is of dimensions $60 \text{ cm} \times 54 \text{ cm} \times 30 \text{ cm}$. How many small cubes with side 6 cm can be placed in the given cuboid?

Ans. Given: Length of cuboid (l) = 60 cm,

Height of cuboid (h) = 30 cm

We know that, Volume of cuboid

$$= l \times b \times h = 60 \times 54 \times 30 \text{ cm}^3$$

And Volume of cube = (Side)³

$$= 6 \times 6 \times 6 \text{ cm}^3$$

\therefore Number of small cubes

$$= \frac{\text{Volume of cuboid}}{\text{Volume of cube}} = \frac{60 \times 54 \times 30}{6 \times 6 \times 6}$$

$$= 450$$

Hence required cubes are 450.

Q5. Find the height of the cylinder whose volume is 1.54 m^3 and diameter of the base is 140 cm.

Ans. Given: Volume of cylinder = 1.54 m^3 and
Diameter of cylinder = 140 cm

$$\therefore \text{Radius } (r) = \frac{d}{2} = \frac{140}{2} = 70 \text{ cm}$$

$$\text{Volume of cylinder} = \pi r^2 h$$

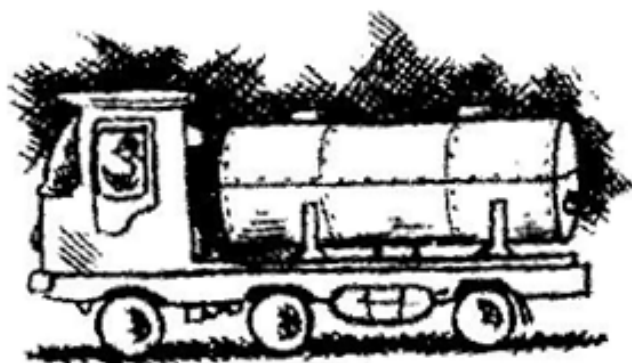
$$\Rightarrow 1.54 = \frac{22}{7} \times 0.7 \times 0.7 \times h$$

$$\Rightarrow h = \frac{1.54 \times 7}{22 \times 0.7 \times 0.7}$$

$$\Rightarrow h = \frac{154 \times 7 \times 10 \times 10}{22 \times 7 \times 7 \times 100} = 1 \text{ m}$$

Hence height of the cylinder is 1 m.

Q6. 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.



Ans. Given: Radius of cylindrical tank (r) = 1.5 m and Height of cylindrical tank (h) = 7 m

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

$$= \frac{22}{7} \times 1.5 \times 1.5 \times 7 = 49.5 \text{ m}^3$$

$$= 49.5 \times 1000 \text{ liters}$$

$$[\because 1 \text{ m}^3 = 1000 \text{ liters}]$$

$$= 49500 \text{ liters}$$

Hence required quantity of milk is 49500 liters.

Q7. 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?

Ans. (i) Let the edge of cube be l .

Since, Surface area of the cube $(A) = 6l^2$

When edge of cube is doubled, then

Surface area of the cube (A')

$$= 6(2l)^2 = 6 \times 4l^2 = 4 \times 6l^2$$

$$A' = 4 \times A$$

Hence surface area will increase four times.

(ii) Volume of cube $(V) = l^3$

When edge of cube is doubled, then

$$\text{Volume of cube } (V') = (2l)^3 = 8l^3$$

$$V' = 8 \times V$$

Hence volume will increase 8 times.

Q8. 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.

Ans. Given: volume of reservoir = 108 m^3

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

$$= \frac{60}{1000} \text{ m}^3 / \text{minute}$$

$$\left[\because 1l = \frac{1}{1000} \text{ m}^3 \right]$$

$$= \frac{60 \times 60}{1000} \text{ m}^3 / \text{hour}$$

$$\therefore \frac{60 \times 60}{1000} \text{ m}^3 \text{ water filled in reservoir will take} = 1 \text{ hour}$$

$$\therefore 1 \text{ m}^3 \text{ water filled in reservoir will take} = \frac{1000}{60 \times 60} \text{ hours}$$

$$\therefore 108 \text{ m}^3 \text{ water filled in reservoir will take} = \frac{108 \times 1000}{60 \times 60} \text{ hours} = 30 \text{ hours}$$

It will take 30 hours to fill the reservoir.

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