NCERT Solutions for Class 8 Maths Chapter 9 Mensuration Ex 9.3

Ex 9.3 Class 8 Maths Question 1.
Given a cylindrical tank, in which situation will you find the surface area and in which situation
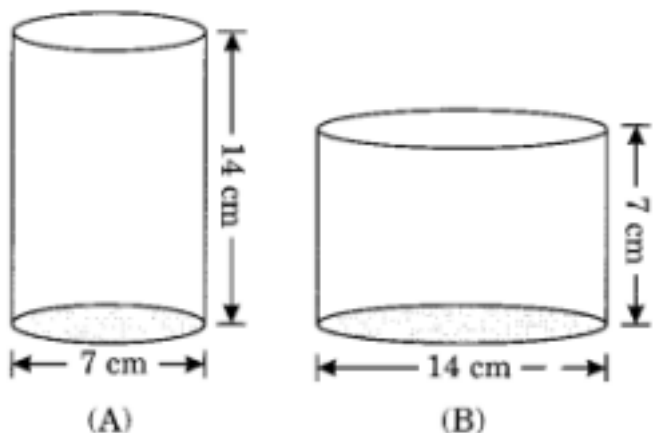

volume.

(a) To find how much it can hold.
(b) Number of cement bags required to plaster it.
(c) To nd the number of smaller tanks that can be lled with water from it.
Solution:
(a) In this situation, we can nd the volume.
(b) In this situation, we can nd the surface area.
(c) In this situation, we can nd the volume.

Ex 9.3 Class 8 Maths Question 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 nding the volume of both the cylinders. Check whether the cylinder with greater volume also has greater surface

area?
Solution:
Cylinder B has a greater volume.
Verication:

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

$$= \frac{\overset{11}{\cancel{22}}}{\cancel{7}} \times \frac{\cancel{7}}{\cancel{2}} \times \frac{7}{\cancel{2}} \times \overset{7}{\cancel{14}}$$

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

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

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

$$= 22 \times 49 = 1078 \text{ cm}^3$$

Hence, volume of cylinder B is double to that of cylinder A. Hence verified.

Total surface area of cylinder A

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

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

$$= \cancel{2} \times \frac{\overset{11}{\cancel{22}}}{\cancel{7}} \times \frac{\cancel{7}}{\cancel{2}} \times \frac{35}{\cancel{2}}$$

$$= 385 \text{ cm}^2$$

Total surface area of cylinder B

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

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

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

$$= 616 \text{ cm}^2$$

Hence, cylinder B has greater surface area.

Ex 9.3 Class 8 Maths Question 3.

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

Solution:

Given: Area of base = lb = 180 cm^2

V = 900 cm^3

Volume of the cuboid = l × b × h

900 = 180 × h

h = 5 cm

Hence, the required height = 5 cm.

Ex 9.3 Class 8 Maths Question 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:

Volume of the cuboid = l × b × h = 60 cm × 54 cm × 30 cm = 97200 cm^3

Volume of the cube = (Side)^3 = (6)^3 = 216 cm^3

Number of the cubes from the cuboid

$$= \frac{\text{Volume of the cuboid}}{\text{Volume of cube}}$$

$$= \frac{97200}{216}$$

$$= 450$$

Hence, the required number of cubes = 450.

Ex 9.3 Class 8 Maths Question 5.

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

V = 1.54 m^3, d = 140 cm = 1.40 m

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

$$1.54 = \frac{22}{7} \times \frac{1.4}{2} \times \frac{1.4}{2} \times h$$

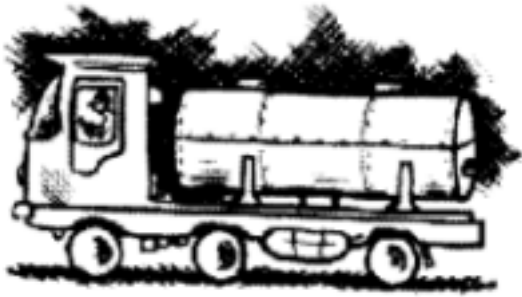$$\Rightarrow \quad h = \frac{1.54 \times 7 \times 2 \times 2}{22 \times 1.4 \times 1.4}$$

$$= \frac{\cancel{154}^{\cancel{14}^{7}} \times 7 \times \cancel{2} \times \cancel{2}}{\cancel{22}_{2} \times \cancel{14}_{2} \times \cancel{14}_{2}}$$

$$= 1 \text{ m}$$

Hence, the height of cylinder = 1 m.

Ex 9.3 Class 8 Maths Question 6.
A milk tank is in the form of a cylinder whose radius is 1.5 m and length is 7 m. Find the quantity of milk in litres that can be stored in the tank.

Solution:

Here, r = 1.5 m

h = 7 m

$\therefore$ Volume of the milk tank = $\pi r^2 h$

= $\frac{22}{7} \times 1.5 \times 1.5 \times 7$

= 22 × 2.25

= 49.50 m^3

Volume of milk in litres = 49.50 × 1000 L ($\because$ 1 m^3 = 1000 litres)

= 49500 L

Hence, the required volume = 49500 L.

Ex 9.3 Class 8 Maths Question 7.

If each edge of a cube is doubled,

(i) how many times will it be surface area increase?

(ii) how many times will its volume increase?

Solution:

Let the edge of the cube = x cm

If the edge is doubled, then the new edge = 2x cm

(i) Original surface area = $6x^2$ cm^2

New surface area = $6(2x)^2 = 6 \times 4x^2 = 24x^2$

Ratio = $6x^2 : 24x^2$ = 1 : 4

Hence, the new surface area will be four times the original surface area.

(ii) Original volume of the cube = x^3 cm^3

New volume of the cube = $(2x)^3 = 8x^3$ cm^3

Ratio = $x^3 : 8x^3$ = 1 : 8

Hence, the new volume will be eight times the original volume.

Ex 9.3 Class 8 Maths Question 8.

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

Solution:

Volume of the reservoir = 108 m^3 = 108000 L [∵1 m^3 = 1000 L]

Volume of water flowing into the reservoir in 1 minute = 60 L

Time taken to fill the reservoir

$$= \frac{\text{Volume of the reservoir}}{\text{Rate of flowing the water}}$$

$$= \frac{108000}{60} \text{ minutes}$$

$$= 1800 \text{ minutes or } \frac{1800}{60} \text{ hours}$$

$$= 30 \text{ hours}$$

Hence, the required hour to ll the reservoir = 30 hours.