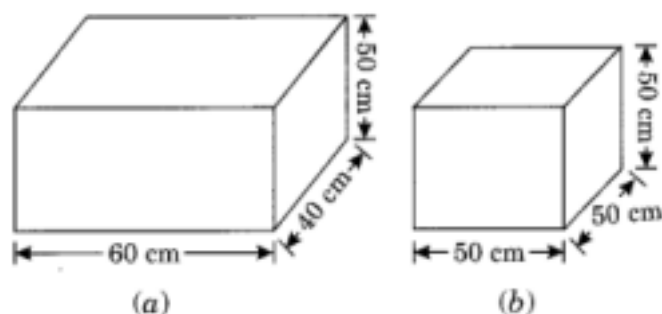


# NCERT Solutions for Class 8 Maths Chapter 9 Mensuration Ex 9.2

Ex 9.2 Class 8 Maths Question 1.

There are two cuboidal boxes as shown in the figure. Which box requires the lesser amount of material to make?



Solution:

$$(a) \text{ Volume of the cuboid} = l \times b \times h = 60 \times 40 \times 50 = 120000 \text{ cm}^3$$

$$(b) \text{ Volume of cube} = (\text{Side})^3 = (50)^3 = 50 \times 50 \times 50 = 125000 \text{ cm}^3$$

Cuboidal box (a) requires lesser amount of material.

Ex 9.2 Class 8 Maths Question 2.

A suitcase with measures 80 cm × 48 cm × 24 cm is to be covered with a tarpaulin cloth. How many metres of tarpaulin of width 96 cm is required to cover 100 such suitcases?

Solution:

Measurement of the suitcase = 80 cm × 48 cm × 24 cm

$l = 80 \text{ cm}$ ,  $b = 48 \text{ cm}$  and  $h = 24 \text{ cm}$

Total surface area of the suitcase =  $2[lb + bh + hl]$

$$= 2 [80 \times 48 + 48 \times 24 + 24 \times 80]$$

$$= 2 [3840 + 1152 + 1920]$$

$$= 2 \times 6912$$

$$= 13824 \text{ cm}^2$$

$$\text{Area of tarpaulin} = \text{length} \times \text{breadth} = l \times 96 = 96l \text{ cm}^2$$

Area of tarpaulin = Area of 100 suitcase

$$96l = 100 \times 13824$$

$$l = 100 \times 144 = 14400 \text{ cm} = 144 \text{ m}$$

Hence, the required length of the cloth = 144 m.

Question 3.

Find the side of a cube whose surface area is 600 cm<sup>2</sup> ?

Solution:

Total surface area of a cube =  $6l^2$

$$6l^2 = 600$$

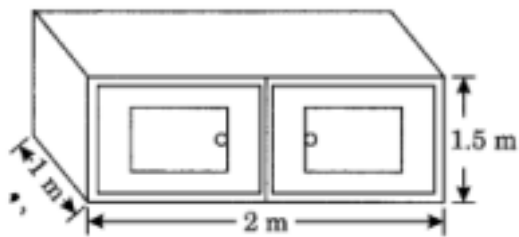
$$l^2 = 100$$

$$l = \sqrt{100} = 10 \text{ cm}$$

Hence, the required length of side = 10 cm.

Ex 9.2 Class 8 Maths Question 4.

Rukhsar painted the outside of the cabinet of measure 1 m × 2 m × 1.5 m. How much surface area did she cover if she painted all except the bottom of the cabinet?



Solution:

$$l = 2 \text{ m}, b = 1.5 \text{ m}, h = 1 \text{ m}$$

Area of the surface to be painted = Total surface area of box – Area of base of box

$$= 2 [lb + bh + hl] - lb$$

$$= 2[2 \times 1.5 + 1.5 \times 1 + 1 \times 2] - 2 \times 1$$

$$= 2[3 + 1.5 + 2] - 2$$

$$= 2[6.5] - 2$$

$$= 13 - 2$$

$$= 11 \text{ m}^2$$

Hence, the required area = 11 m<sup>2</sup>.

Ex 9.2 Class 8 Maths Question 5.

Daniel is painting the walls and ceiling of a cuboidal hall with length, breadth and height of 15 m, 10 m and 7 m respectively. From each can of paint 100 m<sup>2</sup> of the area is painted. How many cans of paint will she need to paint the room?

Solution:

Surface area of a cuboidal hall without bottom = Total surface area – Area of

base =  $2 [lb + bh + hl] - lb$

$$= 2 [15 \times 10 + 10 \times 7 + 7 \times 15] - 15 \times 10$$

$$= 2[150 + 70 + 105] - 150$$

$$= 2 [325] - 150$$

$$= 650 - 150$$

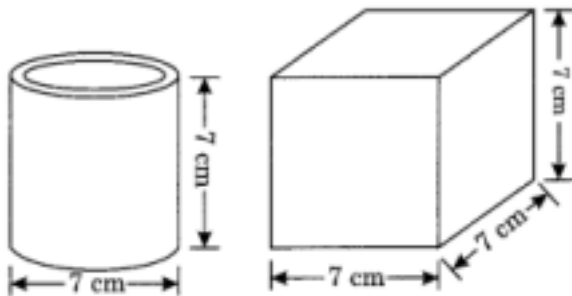
$$= 500 \text{ m}^2$$

Area of the paint in one can =  $100 \text{ m}^2$

$$\text{Number of cans required} = \frac{500}{100} = 5 \text{ cans.}$$

Ex 9.2 Class 8 Maths Question 6.

Describe how the two figures at the right are alike and how they are different. Which box has a larger lateral surface area?



Solution:

The two gures given are cylinder and cube.

Both gures are alike in respect of their same height.

Cylinder:  $d = 7 \text{ cm}$ ,  $h = 7 \text{ cm}$

Cube: Length of each side  $a = 7 \text{ cm}$

Both of the gures are different in respect of their shapes.

Lateral surface of cylinder =  $2\pi rh$

$$= 2 \times \frac{22}{7} \times \frac{7}{2} \times 7 = 154 \text{ cm}^2$$

$$\text{Lateral surface of the cube} = 4l = 4 \times (7) = 4 \times 49 = 196$$

So, cube has the larger lateral surface =  $196 \text{ cm}^2$ .

Ex 9.2 Class 8 Maths Question 7.

A closed cylindrical tank of radius 7 m and height 3 m is made from a sheet of metal. How many sheets of metal is required?

Solution:

$$\text{Area of metal sheet required} = \text{Total surface area of the cylindrical tank} = 2\pi r(h + r)$$

$$= 2 \times \frac{22}{7} \times 7(3 + 7)$$

$$= 2 \times \frac{22}{7} \times 7 \times 10$$

$$= 440 \text{ m}^2$$

Hence, the required area of sheet =  $440 \text{ m}^2$ .

Ex 9.2 Class 8 Maths Question 8.

The lateral surface area of a hollow cylinder is  $4224 \text{ cm}^2$ . It is cut along its height and formed a rectangular sheet of width 33 cm. Find the perimeter of the rectangular sheet.

Solution:

Width of the rectangular sheet = Circumference of the cylinder

$$33 = 2\pi r$$

$$\Rightarrow 33 = 2 \times \frac{22}{7} \times r$$

$$\Rightarrow r = \frac{33 \times 7}{2 \times 22} = \frac{21}{4} \text{ cm}$$

Now lateral surface area of the cylinder =  $2\pi rh$

$$4224 = 2 \times \frac{22}{7} \times \frac{21}{4} \times h$$

$$\therefore h = \frac{4224 \times 7 \times 4}{2 \times 22 \times 21}$$

$$h = 128 \text{ cm}$$

$$l = 128 \text{ cm}, b = 33 \text{ cm}$$

$$\text{Perimeter of the sheet} = 2(l + b) = 2(128 + 33) = 2 \times 161 = 322 \text{ cm}$$

Hence, the required perimeter = 322 cm.

Ex 9.2 Class 8 Maths Question 9.

A road roller takes 750 complete revolutions to move once over to level a road. Find the area of the road if the diameter of a road roller is 84 cm and length is 1 m.

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Solution:

The lateral surface area of the road roller =  $2\pi rh$

$$= 2 \times \frac{22}{7} \times \cancel{42}^6 \times 100$$

$$\left[ \because r = \frac{84}{2} = 42 \text{ cm} \right]$$

$$= 26400 \text{ cm}^2$$

Area covered by the roller in 750 complete revolutions

$$= 26400 \times 750 \text{ cm}^2$$

$$= 19800000 \text{ cm}^2$$

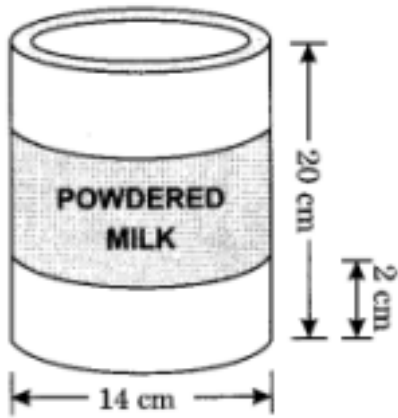
$$\frac{19800000}{10000} \text{ m}^2$$

$$= 1980 \text{ m}^2$$

Hence, the area of road = 1980 m<sup>2</sup>

Ex 9.2 Class 8 Maths Question 10.

A company packages its milk powder in a cylindrical container whose base has a diameter of 14 cm and height 20 cm. The company places a label around the surface of the container (as shown in the figure). If the label is placed 2 cm from top and bottom, what is the area of the label?



Solution:

$$\frac{1}{4}$$

Here,  $r = 7$  cm

$$\frac{2}{2}$$

Height of the cylindrical label =  $20 - (2 + 2) = 16$  cm

Surface area of the cylindrical shaped label =  $2\pi rh$

$$\frac{22}{7}$$

$$= 2 \times \frac{22}{7} \times 7 \times 16$$

$$7$$

$$2$$

$$= 704 \text{ cm}^2$$

Hence, the required area of label =  $704 \text{ cm}^2$ .

