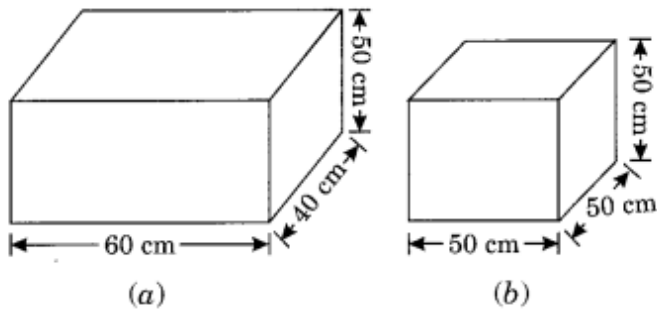


NCERT Solutions for Class 8 Maths Chapter 11 Mensuration Ex 11.3

Ex 11.3 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 11.3 Class 8 Maths Question 2.

A suitcase with measures 80 cm \times 48 cm \times 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 \times 48 cm \times 24 cm

$l = 80$ cm, $b = 48$ cm and $h = 24$ cm

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

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

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

$$= 2 \times 6912$$

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

Area of tarpaulin = length \times 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.

Ex 11.3 Class 8 Maths Question 3.

Find the side of a cube whose surface area is 600 cm^2 ?

Solution:

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

$$6l^2 = 600$$

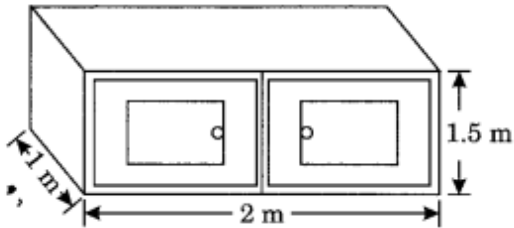
$$l^2 = 100$$

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

Hence, the required length of side = 10 cm.

Ex 11.3 Class 8 Maths Question 4.

Rukhsar painted the outside of the cabinet of measure $1 \text{ m} \times 2 \text{ m} \times 1.5 \text{ m}$. 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^2 .

Ex 11.3 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^2 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

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

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

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

$$= 2 [325] - 150$$

$$= 650 - 150$$

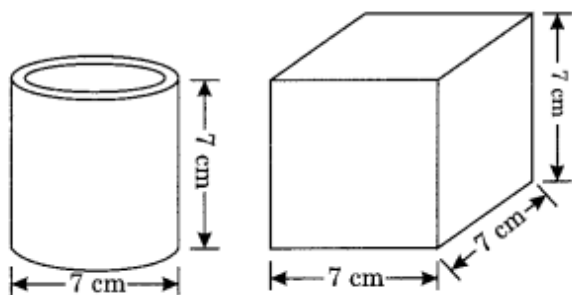
$$= 500 \text{ m}^2$$

Area of the paint in one can = 100 m^2

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

Ex 11.3 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 figures given are cylinder and cube.

Both figures 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 figures are different in respect of their shapes.

Lateral surface of cylinder = $2\pi rh$

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

Lateral surface of the cube = $4l^2 = 4 \times (7)^2 = 4 \times 49 = 196$

So, cube has the larger lateral surface = 196 cm^2 .

Ex 11.3 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:

$$\begin{aligned}
 \text{Area of metal sheet required} &= \text{Total surface area of the cylindrical tank} = 2\pi r(h + r) \\
 &= 2 \times \frac{22}{7} \times 7(3 + 7) \\
 &= 2 \times \frac{22}{7} \times 7 \times 10 \\
 &= 440 \text{ m}^2
 \end{aligned}$$

Hence, the required area of sheet = 440 m².

Ex 11.3 Class 8 Maths Question 8.

The lateral surface area of a hollow cylinder is 4224 cm². 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

$$\begin{aligned}
 33 &= 2\pi r \\
 \Rightarrow 33 &= 2 \times \frac{22}{7} \times r \\
 \Rightarrow r &= \frac{33^3 \times 7}{2 \times 22_2} = \frac{21}{4} \text{ cm}
 \end{aligned}$$

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

$$\begin{aligned}
 4224 &= 2 \times \frac{22}{7} \times \frac{21}{4} \times h \\
 \therefore h &= \frac{4224 \times 7 \times 4^2}{2 \times 22 \times 21}
 \end{aligned}$$

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

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

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

Hence, the required perimeter = 322 cm.

Ex 11.3 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.



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

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

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

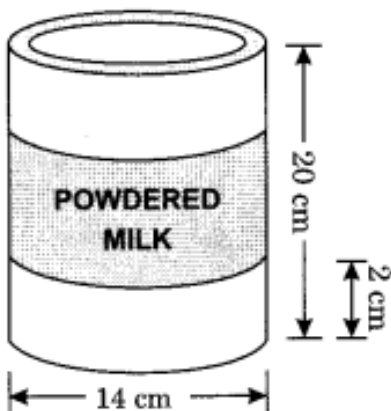
$$\frac{19800000}{10000} \text{ m}^2$$

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

Hence, the area of road = 1980 m^2

Ex 11.3 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:

$$\text{Here, } r = \frac{14}{2} = 7 \text{ cm}$$

$$\text{Height of the cylindrical label} = 20 - (2 + 2) = 16 \text{ cm}$$

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

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

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

Hence, the required area of label = 704 cm².