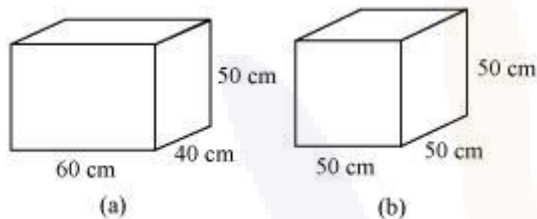




CLASS VIII: Maths  
Chapter 9: Mensuration

Questions and Solutions | Exercise 9.2 - NCERT Books

Q2 : There are two cuboidal boxes as shown in the adjoining figure. Which box requires the lesser amount of material to make



Answer :

We know that,

$$\text{Total surface area of the cuboid} = 2 (lh + bh + lb)$$

$$\text{Total surface area of the cube} = 6 (l)^2$$

$$\text{Total surface area of cuboid (a)} = [2\{(60)(40) + (40)(50) + (50)(60)\}] \text{ cm}^2$$

$$= [2(2400 + 2000 + 3000)] \text{ cm}^2$$

$$= (2 \times 7400) \text{ cm}^2$$

$$= 14800 \text{ cm}^2$$

$$\text{Total surface area of cube (b)} = 6 (50 \text{ cm})^2 = 15000 \text{ cm}^2$$

Thus, the cuboidal box (a) will require lesser amount of material.

**Q2 :** A suitcase with measures 80 cm x 48 cm x 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

**Answer :**

$$\text{Total surface area of suitcase} = 2[(80)(48) + (48)(24) + (24)(80)]$$

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

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

$$\text{Total surface area of 100 suitcases} = (13824 \times 100) \text{ cm}^2 = 1382400 \text{ cm}^2$$

$$\text{Required tarpaulin} = \text{Length} \times \text{Breadth}$$

$$1382400 \text{ cm}^2 = \text{Length} \times 96 \text{ cm}$$

$$\text{Length} = \left( \frac{1382400}{96} \right) \text{ cm} = 14400 \text{ cm} = 144 \text{ m}$$

Thus, 144 m of tarpaulin is required to cover 100 suitcases.

**Q3 :** Find the side of a cube whose surface area is 600 cm<sup>2</sup>.

**Answer :**

$$\text{Given that, surface area of cube} = 600 \text{ cm}^2$$

Let the length of each side of cube be  $l$ .

$$\text{Surface area of cube} = 6 (\text{Side})^2$$

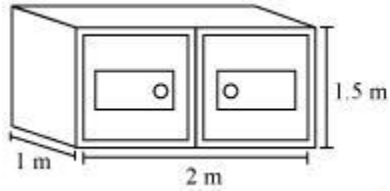
$$600 \text{ cm}^2 = 6l^2$$

$$l^2 = 100 \text{ cm}^2$$

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

Thus, the side of the cube is 10 cm.

Q4 : Rukhsar painted the outside of the cabinet of measure 1 m x 2 m x 1.5 m. How much surface area did she cover if she painted all except the bottom of the cabinet



**Answer :**

Length ( $l$ ) of the cabinet = 2 m

Breadth ( $b$ ) of the cabinet = 1 m

Height ( $h$ ) of the cabinet = 1.5 m

Area of the cabinet that was painted =  $2h(l + b) + lb$

$$= [2 \times 1.5 \times (2 + 1) + (2)(1)] \text{ m}^2$$

$$= [3(3) + 2] \text{ m}^2$$

$$= (9 + 2) \text{ m}^2$$

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

Q5 : 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 area is painted. How many cans of paint will she need to paint the room

**Answer :**

Given that,

Length ( $l$ ) = 15 m, breadth ( $b$ ) = 10 m, height ( $h$ ) = 7 m

Area of the hall to be painted = Area of the wall + Area of the ceiling

$$= 2h(l + b) + lb$$

$$= [2(7)(15 + 10) + 15 \times 10] \text{ m}^2$$

$$= [14(25) + 150] \text{ m}^2$$

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

It is given that 100 m<sup>2</sup> area can be painted from each can.

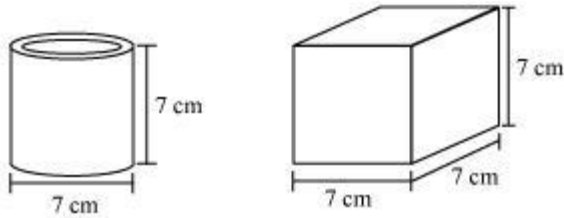
Number of cans required to paint an area of 500 m<sup>2</sup>

$$= \frac{500}{100} = 5$$

Hence, 5 cans are required to paint the walls and the ceiling of the cuboidal hall.

Q6 :

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



Answer :

Similarity between both the figures is that both have the same heights.

The difference between the two figures is that one is a cylinder and the other is a cube.

Lateral surface area of the cube =  $4l^2 = 4(7\text{ cm})^2 = 196\text{ cm}^2$

Lateral surface area of the cylinder =  $2\pi rh = \left(2 \times \frac{22}{7} \times \frac{7}{2} \times 7\right)\text{ cm}^2 = 154\text{ cm}^2$

Hence, the cube has larger lateral surface area.

Q7 :

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

Answer :

Total surface area of cylinder =  $2\pi r(r + h)$

$$= \left[2 \times \frac{22}{7} \times 7(7+3)\right]\text{ m}^2$$

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

Thus, 440 m<sup>2</sup> sheet of metal is required.

**Q8 :** 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 rectangular sheet

**Answer :**

A hollow cylinder is cut along its height to form a rectangular sheet.

Area of cylinder = Area of rectangular sheet

$$4224 \text{ cm}^2 = 33 \text{ cm} \times \text{Length}$$

$$\text{Length} = \frac{4224 \text{ cm}^2}{33 \text{ cm}} = 128 \text{ cm}$$

Thus, the length of the rectangular sheet is 128 cm.

Perimeter of the rectangular sheet =  $2 (\text{Length} + \text{Width})$

$$= [2 (128 + 33)] \text{ cm}$$

$$= (2 \times 161) \text{ cm}$$

$$= 322 \text{ cm}$$

**Q9 :** 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.

**Answer :** In one revolution, the roller will cover an area equal to its lateral surface area.

Thus, in 1 revolution, area of the road covered =  $2\pi rh$

$$\begin{aligned} &= 2 \times \frac{22}{7} \times 42 \text{ cm} \times 1 \text{ m} \\ &= 2 \times \frac{22}{7} \times \frac{42}{100} \text{ m} \times 1 \text{ m} \\ &= \frac{264}{100} \text{ m}^2 \end{aligned}$$

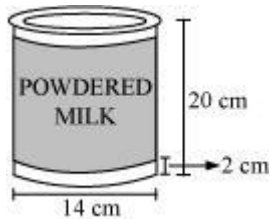
In 750 revolutions, area of the road covered

$$\begin{aligned} &= \left( 750 \times \frac{264}{100} \right) \text{ m}^2 \\ &= 1980 \text{ m}^2 \end{aligned}$$



Q10 :

A company packages its milk powder in cylindrical container whose base has a diameter of 14 cm and height 20 cm. 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.



Answer :

Height of the label = 20 cm - 2 cm - 2 cm = 16 cm

Radius of the label =  $\left(\frac{14}{2}\right)$  cm = 7 cm

Label is in the form of a cylinder having its radius and height as 7 cm and 16 cm.

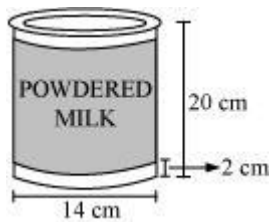
Area of the label =  $2\pi$  (Radius) (Height)

$$= \left(2 \times \frac{22}{7} \times 7 \times 16\right) \text{ cm}^2 = 704 \text{ cm}^2$$



Q11 :

A company packages its milk powder in cylindrical container whose base has a diameter of 14 cm and height 20 cm. 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.



Answer :

Height of the label = 20 cm - 2 cm - 2 cm = 16 cm

Radius of the label =  $\left(\frac{14}{2}\right)$  cm = 7 cm

Label is in the form of a cylinder having its radius and height as 7 cm and 16 cm.

Area of the label =  $2\pi$  (Radius) (Height)

$$= \left(2 \times \frac{22}{7} \times 7 \times 16\right) \text{ cm}^2 = 704 \text{ cm}^2$$