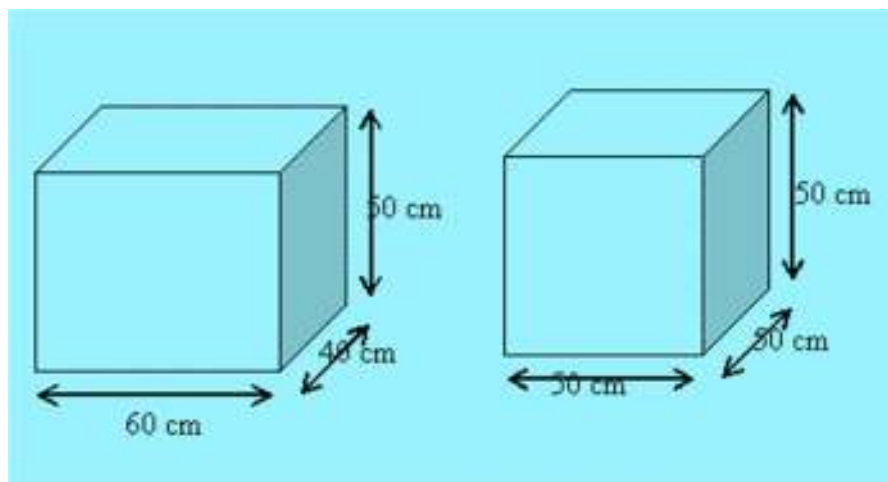


NCERT SOLUTIONS OF Algebraic Exercise 3

Question 1

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



Answer

Volume of the Cuboid is given by

$$= L \times B \times H$$

$$= 60 \times 40 \times 50 = 12000 \text{ cm}^3$$

Volume of Cube = Side³

$$= 50^3 = 125000 \text{ cm}^3$$

As the volume of the cube is greater than that of the cuboid so it will require more material, and the cuboid will require less material

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?

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Answer

Surface Area of Cuboid is given by

$$= 2(LB + LH + BH)$$

$$= 2(80 \times 48 + 80 \times 24 + 48 \times 24)$$

$$= 2(3840 + 1920 + 1152)$$

$$= 2 \times 6912 = 13824$$

Hence, Surface Area of 100 suitcases = 1382400 cm^2

Required tarpaulin will have same area

So required length of tarpaulin = Area / width

$$= 1382400 / 96 = 14400 \text{ cm} = 144 \text{ m}$$

Question 3

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

Answer

Let a be the side

$$\text{Surface Area} = 6 \times \text{side}^2$$

$$600 = 6 \times a^2$$

$$a^2 = 100$$

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

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?

Answer

Surface Area of Cabinet = $2(LB + LH + BH)$

$$= 2(1 \times 2 + 1 \times 1.5 + 1.5 \times 2)$$

$$= 2(2 + 1.5 + 3) = 2 \times 6.5 = 13$$

Area of Bottom Surface = $1 \times 2 = 2 \text{ m}^2$

Hence, Area Covered by painting = $13 - 2 = 11 \text{ m}^2$

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

Answer

Area of All walls, ceilings and floor = $2(LB + LH + BH)$

$$= 2(15 \times 10 + 15 \times 7 + 10 \times 7)$$

$$= 2(150 + 105 + 70)$$

$$= 2 \times 325 = 650$$

Area of Floor = $15 \times 10 = 150$

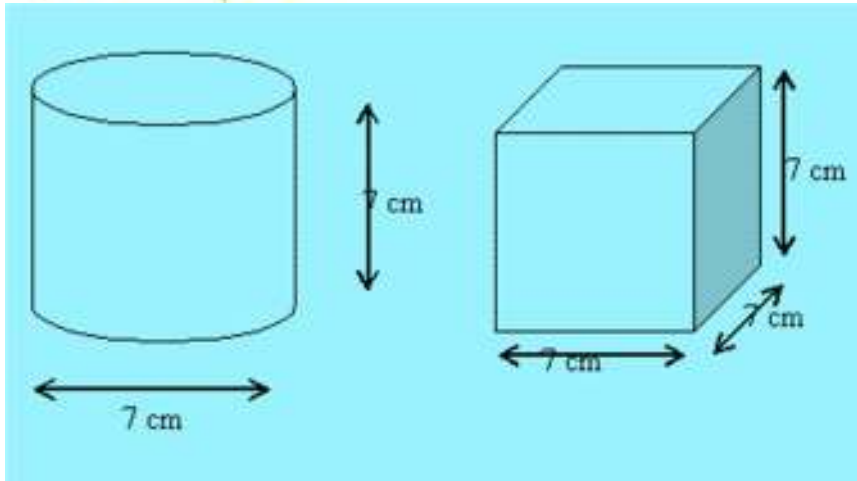
Hence, Painted Area = $650 - 150 = 500$

As, one can of paint is enough for 100 sq m

So, $500/100 = 5$ cans are needed to paint the hall.

Question 6

Describe how the two figures given below are alike and how they are different. Which box has larger lateral surface area?



Answer:

The similarity is that their dimensions are equal

The difference is the figure on the left is cylindrical and that on the right is cuboidal.

Lateral Surface area of cylinder = $2\pi rh = 154 \text{ cm}^2$

Surface Area of Cube = $4 \times \text{side}^2 = 196 \text{ cm}^2$

It is clear that the cylinder is having a larger surface area.

Question 7

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

Surface Area of cylinder = $2\pi rh + 2\pi r^2$

= 440 m^2

Question 8

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

Answer

Area of Rectangular Sheet = Surface Area of the Cylinder

Area of Rectangle = $L \times B$

Or, $L \times B = 4224$

$L \times 33 = 4224$

$L = 128 \text{ cm}$

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.

Answer

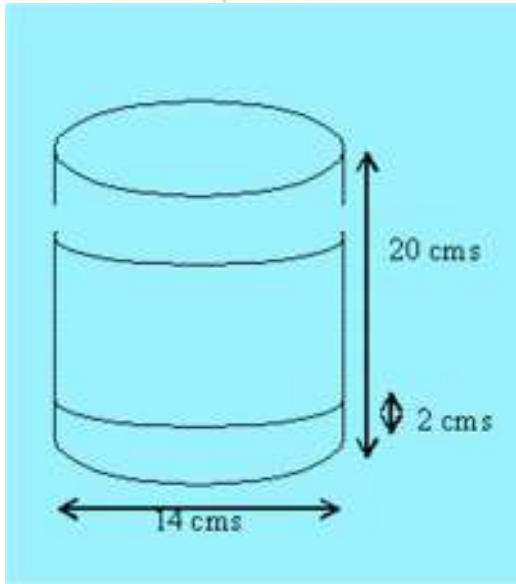
In one revolution the wheel of the roller will cover an area equal to its surface area.

Curved Surface Area of cylinder = $2 \pi r h$

$= 26400 \text{ cm}^2 = 2.64 \text{ m}^2$

Question 10

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: The cylindrical area covered by the label will have

$$\text{Height} = 20 - 4 = 16 \text{ cm}$$

$$\text{Curved Surface area of cylinder} = 2 \pi r h$$

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