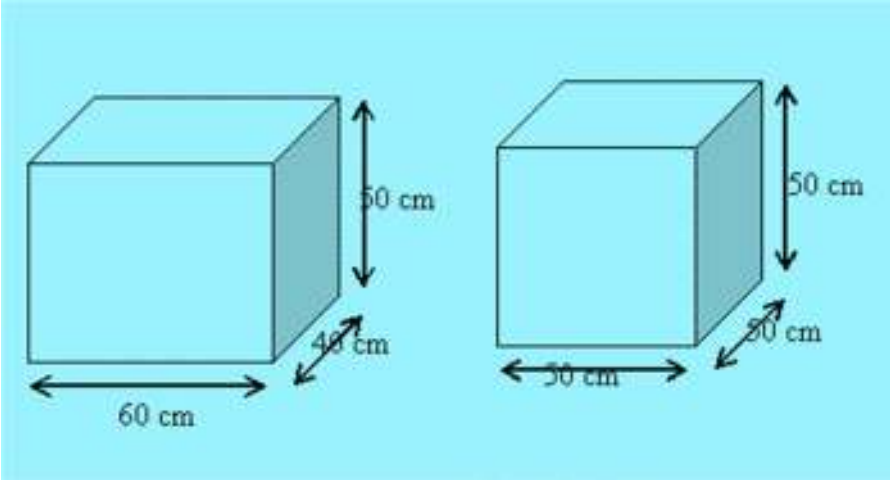
NCERT SOLUTIONS OF Algebraic Exercise 3

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

= Lx B x H

= 60 x 40 x 50 = 12000 cm^3

Volume of Cube = $Side^3$

=50^3 = 125000 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?

Answer

Surface Area of Cuboid is given by

= 2(LB + LH + BH)

= 2 (80 x 48 + 80 x 24 + 48 x 24)

= 2(3840 + 1920 + 1152)

= 2 x 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 cm=144 m

Question 3

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

Answer

Let a be the side

Surface Area = 6 x $side^2$

600 = 6 x a^2

a^2 = 100

a = 10 cm

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?

Answer

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

= 2(1 x 2 + 1 x 1.5 + 1.5 x 2)

= 2(2 + 1.5 + 3) = 2 x 6.5 = 13

Area of Bottom Surface = 1 x 2 = 2 m^2

Hence, Area Covered by painting = 13-2 = 11 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 x 10 + 15 x 7 + 10 x 7)

= 2(150 + 105 + 70)

= 2 x 325 = 650

Area of Floor = 15 x 10 = 150

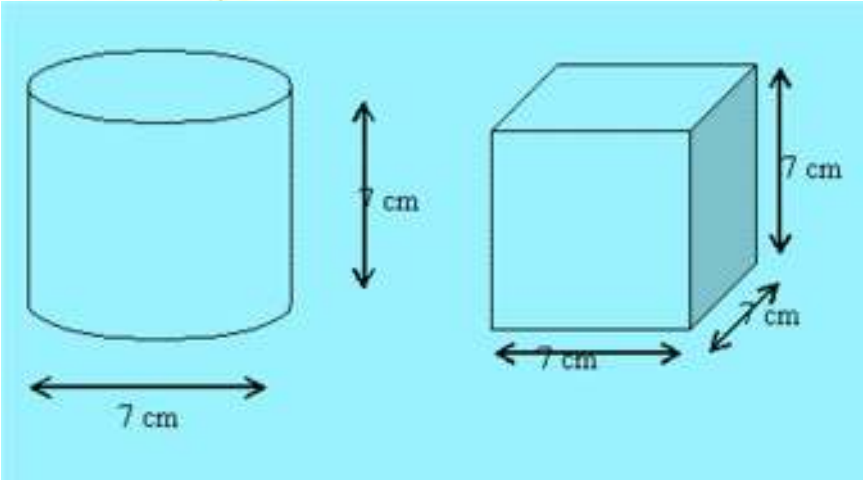
Hence, Painted Area =650-150=500

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 cm^2

Surface Area of Cube= $4 \times side^2$ = 196 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 = Lx B

Or, Lx B = 4224

Lx 33 = 4224

L=128 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

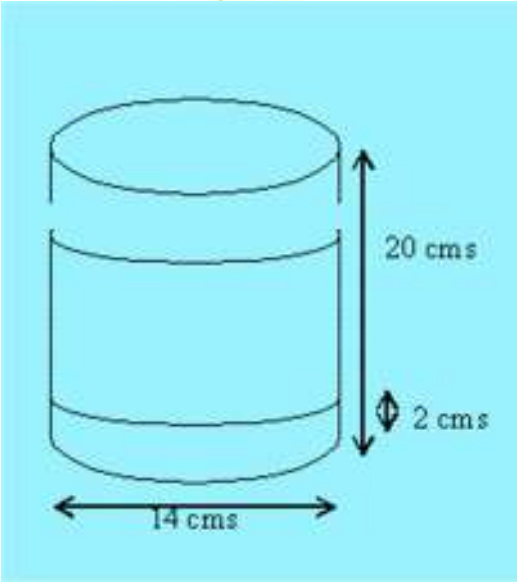
In one revolution the wheel of the roller will cover an area equal to its surface area.

Curved Surface Area of cylinder=2 πrh

=26400 cm^2= 2.64 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

Height = 20-4 = 16 cm

Curved Surface area of cylinder= 2 πrh

=704 cm^2