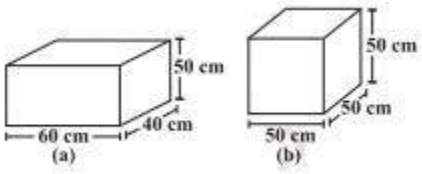
## Exercise 11.3 Page No:186

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




**Solution:**(a) Given: Length of cuboidal box (l) = 60 cm

Breadth of cuboidal box (b) = 40 cm

Height of cuboidal box (h) = 50 cm

∴ Total surface area of cuboidal box = $2\times(lb+bh+hl)$

$= 2\times(60\times40+40\times50+50\times60)$

$= 2\times(2400+2000+3000)$

$= 14800\ cm^2$

(b) Length of cubical box (l) = 50 cm
Breadth of cubicalbox (b) = 50 cm
Height of cubicalbox (h) = 50 cm

∴Total surface area of cubical box = $6(side)^2$

$= 6(50\times50)$

$= 6\times2500$

$= 15000$

Surface area of the cubical box is 15000 $cm^2$

From the result of (a) and (b), cuboidal box requires the lesser amount of material to make.

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

**Solution:** Length of suitcase box, l = 80 cm,

Breadth of suitcase box, b= 48 cm

And Height of cuboidal box , h = 24 cm

Total surface area of suitcase box = 2(lb+bh+hl)

= 2(80×48+48×24+24×80)

= 2 (3840+1152+1920)

= 2×6912

= 13824

Total surface area of suitcase box is 13824 $cm^2$

Area of Tarpaulin cloth = Surface area of suitcase

l×b = 13824

l ×96 = 13824

l = 144

Required tarpaulin for 100 suitcases = 144×100 = 14400 cm = 144 m

Hence tarpaulin cloth required to cover 100 suitcases is 144 m.

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

**Solution:**Surface area of cube = 600 $cm^2$ (Given)

Formula for surface area of a cube = $6(side)^2$

Substituting the values, we get

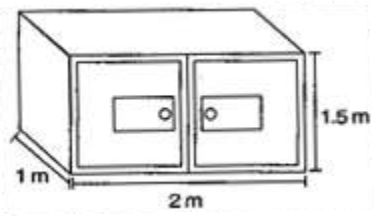
$6(side)^2 = 600$

$(side)^2 = 100$

Or side = ±10

Since side cannot be negative, the measure of each side of a cube is 10 cm

**4. Rukshar 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**:Length of cabinet, l = 2 m, Breadth of cabinet, b = 1 m and Height of cabinet, h = 1.5 m

Surface area of cabinet = lb+2(bh+hl )

= 2×1+2(1×1.5+1.5×2)

= 2+2(1.5+3.0)

= 2+9.0

= 11

Required surface area of cabinet is $11m^2$.

**5. Daniel is paining 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^2of area is painted. How many cans of paint will she need to paint the room?**

**Solution:**Length of wall, l = 15 m, Breadth of wall, b = 10 m and Height of wall, h = 7 m

Total Surface area of classroom = lb+2(bh+hl )

= 15×10+2(10×7+7×15)

= 150+2(70+105)

= 150+350

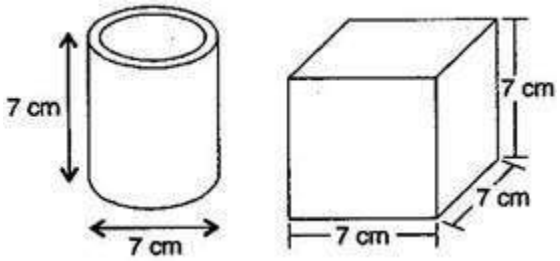
= 500

Now, Required number of cans = Area of hall/Area of one can

= 500/100 = 5

Therefore, 5 cans are required to paint the room.

**6. Describe how the two figures below are alike and how they are different. Which box has larger lateral surface areas?**



**Solution:**

Diameter of cylinder = 7 cm (Given)

Radius of cylinder, r = 7/2 cm

Height of cylinder, h = 7 cm

Lateral surface area of cylinder = $2\pi rh$

= $2\times(22/7)\times(7/2)\times7 = 154$

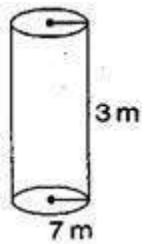
So, Lateral surface area of cylinder is154 $cm^2$
Now, lateral surface area of cube = 4 $(side)^2=4\times7^2 = 4\times49 = 196$

Lateral surface area of cube is 196 $cm^2$

Hence, the cube has larger lateral surface area.

**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?**

**Solution:**




Radius of cylindrical tank, r = 7 m

Height of cylindrical tank , h = 3 m

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

$= 2\times(22/7)\times7(3+7)$

$= 44\times10 = 440$

Therefore, 440 $m^2$ metal sheet is required.

**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?**

**Solution:** Lateral surface area of hollow cylinder = 4224 $cm^2$

Height of hollow cylinder, h = 33 cm and say r be the radius of the hollow cylinder

Curved surface area of hollow cylinder = $2\pi rh$

$4224 = 2\times\pi\times r\times33$

$r = (4224)/(2\pi\times33)$

$r = 64/\pi$

Now, Length of rectangular sheet, $l = 2\pi r$

$l = 2\ \pi\times(64/\pi) = 128$ (using value of r)

So the length of the rectangular sheet is 128 cm.

Also, Perimeter of rectangular sheet = $2(l+b)$

$= 2(128+33)$

$= 322$

The perimeter of rectangular sheet is 322 cm.

**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 1 m.**

**Solution:**

Diameter of road roller, d = 84 cm

Radius of road roller, r = d/2 = 84/2 = 42 cm

Length of road roller, h = 1 m = 100 cm

Formula for Curved surface area of road roller = $2\pi rh$
$= 2\times(22/7)\times42\times100 = 26400$
Curved surface area of road roller is 26400 $cm^2$
Again, Area covered by road roller in 750 revolutions = $26400\times750 cm^2$

$= 1,98,00,000 cm^2$

$= 1980\ m^2$ $[\because 1\ m^2 = 10,000\ cm^2]$

Hence the area of the road is 1980 $m^2$.

**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 figure). If the label is placed 2 cm from top and bottom, what is the area of the label?**


**Solution:**Diameter of cylindrical container , d = 14 cm

Radius of cylindrical container, r = d/2 = 14/2 = 7 cm

Height of cylindrical container = 20 cm

Height of the label, say h = 20–2–2 (from the figure)

= 16 cm

Curved surface area of label = 2πrh

= 2×(22/7)×7×16
= 704

Hence, the area of the label is 704 $cm^2$.