

1. A plastic box 1.5 m long, 1.25 m wide and 65 cm deep is to be made. It is opened at the top. Ignoring the thickness of the plastic sheet, determine:
- The area of the sheet required for making the box.
 - The cost of sheet for it, if a sheet measuring 1m^2 costs Rs. 20

Sol. (i) Length of plastic box $l = 1.5\text{m}$, breadth $b = 1.25\text{m}$ and height $h = 65\text{cm} = 0.65\text{m}$

Area of sheet required for making a plastic box = Total surface area of box – Area of top of box

$$= 2(lb + bh + hl) - lb = 2(1.5 \times 1.25 + 1.25 \times 0.65 + 1.5 \times 0.65) - 1.5 \times 1.25\text{m}^2$$

$$= 2(1.875 + 0.8125 + 0.975) - 1.875\text{m}^2$$

$$= 2(3.6625) - 1.875\text{m}^2$$

$$= 7.325 - 1.875 = 5.45\text{m}^2$$

Hence, the area of the sheet required for making the box is 5.45m^2 .

(ii) Total cost of sheet = Rs. $20 \times 5.45 = \text{Rs. } 109$

2. The length, breadth and height of a room are 5 m, 4 m and 3 m respectively. Find the cost of white washing the walls of the room and the ceiling at the rate of Rs. 7.50 per m^2 .

Sol. Length of room $l = 5\text{m}$, breadth $b = 4\text{m}$ and height $h = 3\text{m}$

Area of four walls and ceiling = Total surface area of room – area of floor $= 2(lb + bh + hl) - lb$

$$= 2(5 \times 4 + 4 \times 3 + 3 \times 5) - 5 \times 4\text{m}^2$$

$$= 2(20 + 12 + 15) - 20\text{m}^2$$

$$= 2(47) - 20\text{m}^2$$

$$= 94 - 20 = 74\text{m}^2$$

Therefore, the area of four walls and ceiling $= 74\text{m}^2$

Hence, the cost of white washing the walls of the room and the ceiling $= \text{Rs. } 7.50 \times 74 = \text{Rs. } 555.00$

3. A small indoor greenhouse (herbarium) is made entirely of glass panes (including base) held together with tape. It is 30 cm long, 25 cm wide and 25 cm high.

(i) What is the area of the glass?

(ii) How much of tape is needed for all the 12 edges?

Download

NTSEGURU Mobile App

FREE from



&

BOOST 

Your NTSE/Board/CBSE Preparation

Rating: 4.5
on Playstore



Download The App



Sol. (i) Length of greenhouse $l = 30$ cm, breadth $b = 25$ cm and height $h = 25$ cm

$$\begin{aligned}\text{Total surface area of greenhouse} &= 2(lb + bh + hl) \\ &= 2(30 \times 25 + 25 \times 25 + 25 \times 30) \text{ cm}^2 = 2(750 + 625 + 750) \text{ cm}^2 \\ &= 2(2125) \text{ cm}^2 \\ &= 4250 \text{ cm}^2\end{aligned}$$

Hence, the area of glass for greenhouse $= 4250 \text{ cm}^2$.

(ii) Length of greenhouse $l = 30$ cm, breadth $b = 25$ cm and height $h = 25$ cm

$$\begin{aligned}\text{Length of tape for all 12 edges (4 Length, 4 Breadth and 4 Height)} &= 4(l + b + h) \\ &= 4(30 + 25 + 25) \text{ cm} = 4(80) \text{ cm} \\ &= 320 \text{ cm}\end{aligned}$$

Hence, for all 12 edges, 320 cm tape is required.

- 4.** Parveen wanted to make a temporary shelter for her car, by making a box-like structure with tarpaulin that covers all the four sides and the top of the car (with the front face as a flap which can be rolled up). Assuming that the stitching margins are very small, and therefore negligible, how much tarpaulin would be required to make the shelter of height 2.5 m, with base dimensions $4 \text{ m} \times 3 \text{ m}$?

Sol. Length of shelter $l = 4$ m, breadth $b = 3$ m and height $h = 2.5$ m

$$\begin{aligned}\text{Area of four walls and top of shelter} &= \text{total area of shelter} - \text{area of floor} = 2(lb + bh + hl) - lb \\ &= 2(4 \times 3 + 3 \times 2.5 + 2.5 \times 4) - 4 \times 3 \text{ m}^2 \\ &= 2(12 + 7.5 + 10) - 12 \text{ m}^2 \\ &= 2(29.5) - 12 \text{ m}^2 \\ &= 59 - 12 = 47 \text{ m}^2\end{aligned}$$

Hence, 47 m^2 tarpaulin is required to make this shelter.

Assume $\pi = \frac{22}{7}$, unless stated otherwise.

- 5.** The curved surface area of a right circular cylinder of height 14 cm is 88 cm^2 . Find the diameter of the base of the cylinder.

Sol. Curved surface area of cylinder 88 cm^2 and height $= 14$ cm

Let, the radius of base of cylinder $= r$ cm

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

$$\Rightarrow 88 = 2 \times \frac{22}{7} \times r \times 14 \quad \Rightarrow 88 = 88r \Rightarrow r = 1 \text{ cm}$$

Hence, the diameter of base of cylinder $= 2r = 2 \times 1 = 2 \text{ cm}$

**Success
STORY**

I still wonder how one man has such a deep understanding of an examination. It becomes the truth what ever Vipin Sir says about NTSE.

M. Pareek

An
NTSE Scholar
IIT-JEE (Adv.) AIR-3

Mukesh Pareek



6. Find the total surface area of a cone, if its slant height is 21 m and diameter of its base is 24 m.

Sol. Radius of cone $r = 24/2 = 12$ cm and slant height $l = 21$ cm

Total surface area of cone $= \pi r(r + l)$

$$= \frac{22}{7} \times 12 \times (12 + 21)$$

$$= \frac{22}{7} \times 12 \times 33$$

$$= 1244.57 \text{ m}^2$$

Hence, the total surface area of cone is $= 1244.57 \text{ m}^2$.

7. Find the surface area of a sphere of diameter:

(i) 14 cm

(ii) 21 cm

(iii) 3.5 m

Sol. (i) Radius of sphere $r = 14/2 = 7$ cm

Surface area of sphere $= 4\pi r^2$

$$= 4 \times \frac{22}{7} \times 7 \times 7 = 4 \times 22 \times 7 = 616 \text{ cm}^2$$

Hence, the surface area of sphere 616 cm^2 .

(ii) Radius of sphere $r = 21/2 = 10.5$ cm

Surface area of sphere $= 4\pi r^2$

$$= 4 \times \frac{22}{7} \times 10.5 \times 10.5 = 4 \times 22 \times 1.5 \times 10.5 = 1386 \text{ cm}^2$$

Hence, the surface area of sphere is 1386 cm^2 .

(iii) Radius of sphere $r = 3.5/2 = 1.75$ cm

Surface area of sphere $= 4\pi r^2$

$$= 4 \times \frac{22}{7} \times 1.75 \times 1.75 = 4 \times 22 \times 0.25 \times 1.75$$

$$= 38.50 \text{ cm}^2$$

Hence, the surface area of sphere is 38.50 cm^2 .

8. Find the total surface area of a hemisphere of radius 10 cm. (Use $\pi = 3.14$)

Sol. Radius of hemisphere $r = 10$ cm

Surface area of hemisphere $= 3\pi r^2$

$$= 3 \times 3.14 \times 10 \times 10 = 942 \text{ cm}^2$$

Hence, the total surface area hemisphere is 942 cm^2 .

Unburden
the parents of your
Study Expenses

Govt. of India
provides you scholarship
till Post Graduation studies
after your crack NTSE exam

Login to ntseguru.in for best NTSE Preparation



9. A capsule of medicine is in the shape of a sphere of diameter 3.5 mm. How much medicine (in mm^3) is needed to fill this capsule?

Sol. Radius of capsule $r = 3.5/2 = 1.75$ mm

$$\text{Volume of medicine to fill the capsule} = \frac{4}{3}\pi r^3$$

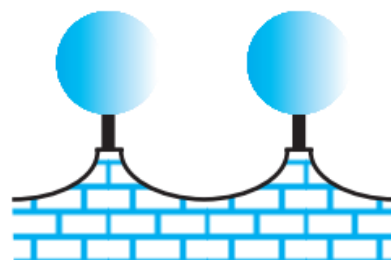
$$= \frac{4}{3} \times \frac{22}{7} \times 1.75 \times 1.75 \times 1.75$$

$$= \frac{4}{3} \times 22 \times 0.25 \times 1.75 \times 1.75$$

$$= 22.46 \text{ mm}^3 \text{ (approx.)}$$

Hence, 22.46 mm^3 medicine is required to fill this capsule.

10. The front compound wall of a house is decorated by wooden spheres of diameter 21 cm, placed on small supports as shown in Fig. Eight such spheres are used for this purpose, and are to be painted silver. Each support is a cylinder of radius 1.5 cm and height 7 cm and is to be painted black. Find the cost of paint required if silver paint costs 25 paise per cm^2 and black paint costs 5 paise per cm^2 .



Sol. Radius of sphere $R = 21/2 = 10.5$ cm
Radius of cylindrical support $r = 1.5$ cm and height $h = 7$ cm
Surface area of sphere $= 4\pi R^2$

$$= 4 \times \frac{22}{7} \times 10.5 \times 10.5$$

$$= 4 \times 22 \times 1.5 \times 10.5$$

$$= 1386 \text{ cm}^2$$

Area of hidden surface by cylindrical support $= \pi r^2$

$$= \frac{22}{7} \times 1.5 \times 1.5$$

$$= 7.07 \text{ cm}^2$$

Total area of 1 sphere for silver painting $= 1386 - 7.07 = 1378.93 \text{ cm}^2$

Therefore, the total area of 8 sphere for silver painting $= 8 \times 1378.93 = 11031.44 \text{ cm}^2$

Total cost of painting at the rate of 25 paise per $\text{cm}^2 = \text{Rs.} 11031.44 \times 0.25 = \text{Rs.} 2757.86$

Radius of cylindrical support $r = 1.5$ cm and height $h = 7$ cm

A Team that made
Cracking NTSE
Easier Than Ever



The curved surface area of cylindrical part $= 2\pi rh$

$$= 2 \times \frac{22}{7} \times 1.5 \times 7$$

$$= 2 \times 22 \times 1.5$$

$$= 66\text{cm}^2$$

Total area of 1 cylindrical support for black painting $= 66\text{cm}^2$

Therefore, the total area of 8 cylindrical support for black painting $= 8 \times 66 = 528\text{cm}^2$

Cost of painting at the rate of 5 paise per $\text{cm}^2 = \text{Rs. } 528 \times 0.05 = \text{Rs. } 26.40$

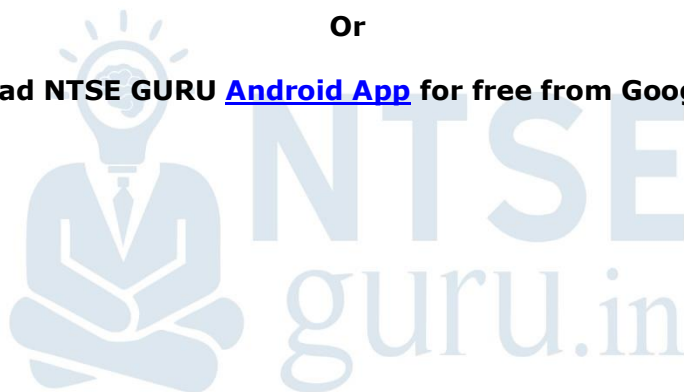
Therefore, the total cost of painting $= \text{Rs. } 2757.86 + \text{Rs. } 26.40 = \text{Rs. } 2784.26$

Hence, the total cost of silver and black painting is Rs. 2784.26.

For complete NCERT Solutions visit www.ntseguru.in & take a free demo.

Or

Download NTSE GURU [Android App](#) for free from Google Playstore.



Did you know?



NTSE
guru.in

Best platform for NTSE
as well as class 8th, 9th, 10th,
CBSE & other state boards exam.

