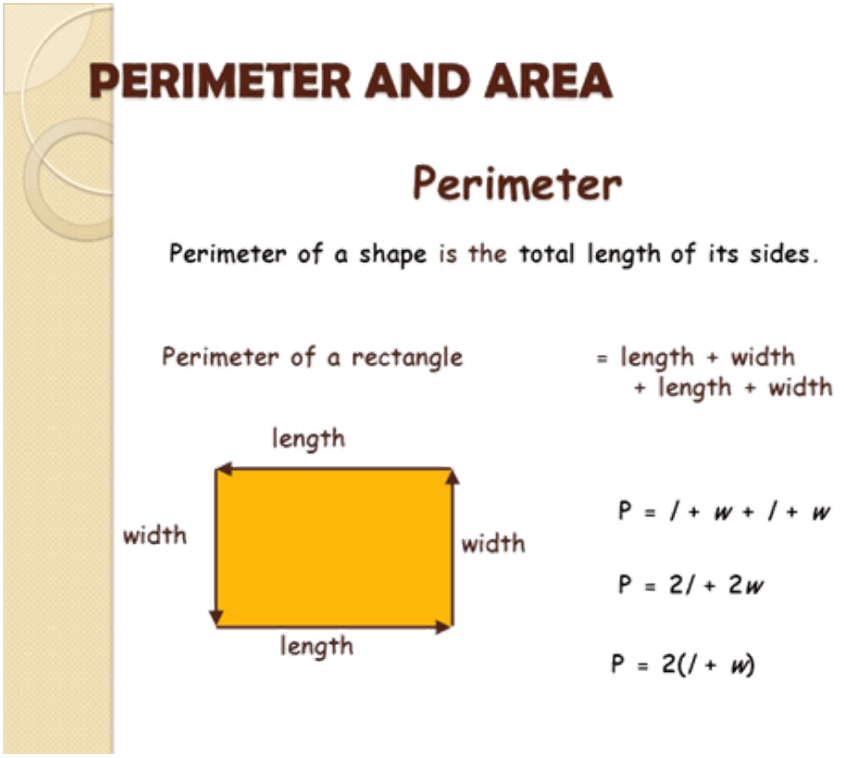
NCERT Class 9 Solutions: Surface Areas and Volumes (Chapter 13) Exercise 13.1 – Part 1



Q-1 A plastic box $1.5m$ long, $1.25m$ wide and $65\,cm$ deep is to be made. It is opened at the top. Ignoring the thickness of the plastic sheet, determine:

1. The area of the sheet required for making the box.
2. The cost of sheet, if a sheet measuring $1m^2$ costs $₹20$.

Solution:

- Plastic box length is $(l) = 1.5m$
- Plastic box width is $(b) = 1.25m$
- Plastic box depths is $(h) = 65\ cm = 0.65m$

Solution (i) The area of sheet required to make the box is equal to the surface area of the box excluding the top.

- Surface area of the box = Lateral surface area + Area of the base
- $2(l + b) \times h + (l \times b)$
- $2(1.5 + 1.25) \times 0.65 + (1.5 \times 1.25)$
- $(3.575 + 1.875)\ m^2$
- $5.45m^2$

The sheet required required to make the box is $5.45m^2$

Solution (ii) Cost of $1m^2$ of sheet $= ₹20$

∴ Cost of $5.45m^2$ of sheet $= ₹(20 \times 5.45) = ₹109$

Q-2 The length, breadth and height of a room are $5m, 4m \text{and} 3m$ respectively. Find the cost of white washing the walls of the room and the ceiling at the rate of $₹7.50\ perm^2$

Solution:

- The room length is $(l) = 5m$
- The room breadth is $(b) = 4m$
- The room height is $(h) = 3m$

Area of four walls including the ceiling = Area of walls ($2 \times l \times h + 2 \times l \times b$) + area of ceiling ($l \times b$)

- $2(l+b)\times h+(l\times b)$
- $2(5+4)\times 3+(5\times 4)\,m^2$
- $(54+20)\,m^2$
- $74m^2$

Cost of white washing $= ₹7.50\,perm^2$

Total cost $= ₹.(74\times 7.50) = ₹.555$

Q-3 The floor of a rectangular hall has a perimeter $250m$. If the cost of painting the four walls at the rate of $₹.10\,perm^2$ is $₹15000$, find the height of the hall.

Solution:

- Perimeter of rectangular hall $= 2(l+b) = 250m$
- Total cost of painting $= ₹15000$
- Rate per $m^2 = ₹.10$

Area of four walls = $2\times l\times h+2\times b\times h=(2\times l+2\times b)\times h$

- Now $(2\times l+2\times b)$ is the perimeter of the floor which is 250 m. Therefore, area of four walls is $(250\times h)\,m^2$
- Total cost of painting = Area of four walls hall × rate per square m $=(250\times h)\times 10 = ₹15000$
- Therefore, $2500\times h = ₹15000$ or $h=\frac{15000}{2500}m=6m$

So, the height of the hall is $6m.$