

Exercise 20A

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Q1.
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Answer:
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Volume of a cuboid = (Length 	imes Breadth 	imes Height) cubic units
Total surface area =2(lb+bh+lh) sq units
Lateral surface area = [2(l+b) 	imes h] sq units
(i) Length = 22 cm, breadth = 12 cm, height = 7.5 cm
Volume = (Length \times Breadth \times Height) = (22 \times 12 \times 7.5) = 1980 \ cm^3
Total surface area
= 2(lb + bh + lh) = 2[(22 \times 12) + (22 \times 7.5) + (12 \times 7.5)] = 2[264 + 165 + 90] = 1038 \text{ cm}^2
Lateral surface area =[2(l+b)	imes h]=2(22+12)	imes 7.5=510~cm^2
(ii) Length = 15 m, breadth = 6 m, height = 9 dm = 0.9 m
\mbox{Volume} = \left( Length \times Breadth \times Height \right) = \left( 15 \times 6 \times 0.9 \right) = 81 \ m^3
Total surface area = 2(lb+bh+lh)
= 2[(15 \times 6) + (15 \times 0.9) + (6 \times 0.9)] = 2[90 + 13.5 + 5.4] = 217.8 \, m^2
Lateral surface area = [2(l+b) \times h] = 2(15+6) \times 0.9 = 37.8 \ m^2
(iii) Length = 24 m, breadth = 25 cm = 0.25 m, height = 6 m
Volume = (Length \times Breadth \times Height) = (24 \times 0.25 \times 6) = 36 \text{ m}^3
Total surface area = 2(lb + bh + lh)
= 2[(24 \times 0.25) + (24 \times 6) + (0.25 \times 6)] = 2[6 + 144 + 1.5] = 303 \, m^2
Lateral surface area =[2(l+b)	imes h]=2(24+0.25)	imes 6=291~m^2
(iv) Length = 48 cm = 0.48 m, breadth = 6 dm = 0.6 m, height = 1 m
Volume = (Length \times Breadth \times Height) = (0.48 \times 0.6 \times 1) = 0.288 \, m^3
Total surface area
=2(lb+bh+lh)=2[(0.48\times0.6)+(0.48\times1)+(0.6\times1)]=2[0.288+0.48+0.6]=2.736
Lateral surface area = [2(l+b) \times h] = 2(0.48+0.6) \times 1 = 2.16 \ m^2
Q2.
Answer:
1\,m\,=\,100\,cm
Therefore, dimensions of the tank are:
2\ m\ 75\ cm 	imes\ 1\ m\ 80\ cm 	imes\ 1\ m\ 40\ cm = 275\ cm\ 	imes\ 180\ cm\ 	imes\ 140\ cm
\therefore Volume = Length \times Breadth \times Height = 275 \times 180 \times 140 = 6930000 cm<sup>3</sup>
Also, 1000cm^3=1L
\therefore Volume = rac{6930000}{1000} = 6930~L
03.
Answer:
\therefore Dimensions of the iron piece = 105~cm \times 70~cm \times 1.5~cm
Total volume of the piece of iron = (105 \times 70 \times 1.5) = 11025 \ cm^3
1 cm3 measures 8 gms.
:: Weight of the piece
=11025 \times 8 = 88200 g = \frac{88200}{1000} = 88.2 kg
                                                                           (because\ 1\ kg\ =\ 1000\ g)
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Q4.
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Answer:

$$1 \, cm = 0.01 \, m$$

Volume of the gravel used = **Area** \times **Height** = (3750 \times 0.01) = 37.5 m^3 Cost of the gravel is Rs 6.40 per cubic meter.

$$\therefore$$
 Total cost $=$ (37.5 \times 6.4) $=$ Rs 240

Q5.

Answer:

Total volume of the hall= $(16 \times 12.5 \times 4.5) = 900 \ m^3$

It is given that $3.6\ m^3$ of air is required for each person.

The total number of persons that can be accommodated in that hall

$$= \frac{\text{Total volume}}{\text{Volume required by each person}} = \frac{900}{3.6}$$
$$= 250 \text{ people}$$

Q6.

Answer:

Volume of the cardboard box = $\left(120 \times 72 \times 54\right) = 466560~cm^3$

Volume of each bar of soap=
$$(6 \times 4.5 \times 4) = 108 \ cm^3$$

Total number of bars of soap that can be accommodated in that box

$$=rac{ ext{Volume of the box}}{ ext{Volume of each soap}}=rac{466560}{108}=4320 ext{ bars}$$

Q7.

Answer:

Volume occupied by a single matchbox= $(4 \times 2.5 \times 1.5) = 15 \ cm^3$

Volume of a packet containing 144 matchboxes $= (15 \times 144) = 2160 \ cm^3$

Volume of the carton= $(150 \times 84 \times 60) = 756000 \ cm^3$

Total number of packets is a carton = $\frac{\text{Volume of the carton}}{\text{Volume of a packet}} = \frac{75600}{2160} = 350 \text{ packets}$

Q8.

Answer:

Total volume of the block = $(500 \times 70 \times 32) = 1120000~cm^3$

Total volume of each plank $=200\times25\times8=40000~cm^3=200\times25\times8=40000~cm^3$

 $\text{$:$ Total number of planks that can be made} = \frac{ \text{$ \text{Total volume of the block} \\ \text{$ \text{Volume of each plank} $} } = \frac{1120000}{40000} = 28 \, \text{planks}$

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