Class Notes

Class: VIII	Topic: Ch.11 Mensuration "This content is prepared absolutely from home."
Subject: Mathematics	

Ex.11.3

Soln.1(a) Length of cuboidal box (l) = 60 cm
Breadth of cuboidal box (b) = 40 cm
Height of cuboidal box (h) = 50 cm
$\therefore$ Total surface area of cuboidal box

$= 2(lb + bh + hl)$

= 2 (60 × 40 + 40 × 50 + 50 × 60)
= 2 (2400 + 2000 + 3000
= 2 × 7400 = 14800 cm^2

(b) Total surface area of cube(b) = $6(50)^2$
=15000cm^2

Thus, the cuboidal box(a) will require lesser amount of material.

Soln.2 Measurement of the suitcase
= 80 cm × 48 cm × 24 cm
l= 80 cm, b = 48 cm and h = 24 cm
Total surface area of the suitcase
= 2[lb + bh + hl]
= 2 [80 × 48 + 48 × 24 + 24 × 80]
= 2 [3840 + 1152 + 1920]
= 2 × 6912
= 13824 cm^2
Area of tarpaulin = length × breadth = l × 96 cm^2
Area of tarpaulin = Area of 100 suitcase
96 × l = 100 × 13824
l = 100 × 144 = 14400 cm = 144 m
Hence, the required length of the cloth =144m.

Soln.4 l = 2 m, b = 1.5 m, h = 1 m
Area of the surface to be painted
= Total surface area of box – Area of base of box
= 2 [lb + bh + hl] – lb
= 2[2 × 1.5 + 1.5 × 1 + 1 × 2] – 2 × 1
= 2[3 + 1.5 + 2] – 2
= 2[6.5] – 2
= 13 – 2
= 11 m^2
Hence, the required area = 11 m^2.

Ex.11.4

Soln.3 Area of base = lb = 180 cm^2
V = 900 cm^3
Volume of the cuboid = l × b × h
900 = 180 × h
h = 5 cm
Hence, the required height = 5 cm.

Soln.4 Volume of the cuboid
= l × b × h = 60 cm × 54 cm × 30 cm = 97200 cm^3
Volume of the cube = $(\text{Side})^3 = (6)^3$ = 216 cm^3
Number of the cubes from the cuboid

$= \frac{\text{Volume of the cuboid}}{\text{Volume of cube}}$

$= \frac{97200}{216}$

= 450

Soln.5
V = 1.54 m^3, d = 140 cm = 1.40 m
Volume of the cylinder = $\pi r^2 h$

$$1.54 = \frac{22}{7} \times \frac{1.4}{2} \times \frac{1.4}{2} \times h$$

$$\Rightarrow \quad h = \frac{1.54 \times 7 \times 2 \times 2}{22 \times 1.4 \times 1.4}$$

$$= \frac{\cancel{154}^{\cancel{14}^{7}} \times \cancel{7} \times \cancel{2} \times \cancel{2}}{\cancel{22}_2 \times \cancel{14}_2 \times \cancel{14}_2}$$

= 1 m

Hence, the height of cylinder = 1 m.

Soln6.
Here, r = 1.5 m
h = 7 m
∴ Volume of the milk tank = $\pi r^2 h$
= 227 × 1.5 × 1.5 × 7
= 22 × 2.25
= 49.50 m^3
Volume of milk in litres = 49.50 × 1000 L (∵ 1 m^3 = 1000 litres)
= 49500 L

Soln.5 Surface area of a cuboidal hall without bottom
= Total surface area – Area of base
= 2 [lb + bh + hl] – lb
= 2 [15 × 10 + 10 × 7 + 7 × 15] – 15 × 10
= 2[150 + 70 + 105] – 150
= 2 [325] – 150
= 650 – 150
= 500 m^2
Area of the paint in one can = 100 m^2
Number of cans required = $\frac{500}{100}$ = 5 cans.

Soln.8 Width of the rectangular sheet
= Circumference of the cylinder

$33 = 2\pi r$

$\Rightarrow 33 = 2 \times \frac{22}{7} \times r$

$\Rightarrow r = \frac{33^3 \times 7}{2 \times 22_2} = \frac{21}{4}$ cm

Now lateral surface area of the cylinder = $2\pi rh$

$4224 = 2 \times \frac{22}{7} \times \frac{21}{4} \times h$

$\therefore h = \frac{4224 \times 7 \times 4}{2 \times 22 \times 21}$

h = 128 cm
l = 128 cm, b = 33 cm
Perimeter of the sheet = 2(l + b)
= 2(128 + 33) = 2 × 161 = 322 cm
Hence, the required perimeter = 322 cm.

Soln.2 Cylinder B has a greater volume.
Verification:
Volume of cylinder A = $\pi r^2 h$

$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 14$

$= 539 \text{ cm}^3$

Volume of cylinder B = $\pi r^2 h$

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

$= 22 \times 49 = 1078 \text{ cm}^3$

Hence, volume of cylinder B is double to that of cylinder A. Hence verified.

Total surface area of cylinder A

$= 2\pi r(h + r)$

$= 2 \times \frac{22}{7} \times \frac{7}{2}\left(\frac{7}{2} + 14\right)$

$= 2 \times \frac{22}{7} \times \frac{7}{2} \times \frac{35}{2}$

$= 385 \text{ cm}^2$

Total surface area of cylinder B

$= 2\pi r(h + r)$

$= 2 \times \frac{22}{7} \times 7(7 + 7)$

$= 2 \times \frac{22}{7} \times 7 \times 14$

$= 616 \text{ cm}^2$

Hence, cylinder B has greater surface area.

Soln.9 The lateral surface area of the road roller = 2πrh

$= 2 \times \frac{22}{7} \times 42 \times 100$

$\left[\because r = \frac{84}{2} = 42 \text{ cm}\right]$

$= 26400 \text{ cm}^2$

Area covered by the roller in 750 complete revolutions

$= 26400 \times 750 \text{ cm}^2$

$= 19800000 \text{ cm}^2$

$\frac{19800000}{10000} \text{ m}^2$

$= 1980 \text{ m}^2$

Hence, the area of road = $1980 m^2$

Soln.7 Let the edge of the cube = x cm
If the edge is doubled, then the new edge = 2x cm
(i) Original surface area = $6x^2$ cm^2
New surface area = $6(2x)^2 = 6 \times 4x^2 = 24x^2$
Ratio = $6x^2 : 24x^2$ = 1 : 4
Hence, the new surface area will be four times the original surface area.
(ii) Original volume of the cube = x^3 cm^3
New volume of the cube = $(2x)^3 = 8x^3$ cm^3
Ratio = $x^3 : 8x^3$ = 1 : 8
Hence, the new volume will be eight times the original.

Soln.10 Here, r = 14/2 = 7 cm
Height of the cylindrical label
= 20 – (2 + 2) = 16 cm
Surface area of the cylindrical shaped label = 2πrh
= 2 × 227 × 7 × 16
= 704 cm^2
Hence, the required area of label
= 704 cm^2.

Soln.8 Volume of the reservoir = 108 m^3 = 108000 L
[∵1 m^3 = 1000 L]
Volume of water flowing into the reservoir in 1minute=60

$= \frac{\text{Volume of the reservoir}}{\text{Rate of flowing the water}}$

$= \frac{108000}{60}$ minutes

$= 1800$ minutes or $\frac{1800}{60}$ hours

$= 30$ hours

Time taken to fill the reservoir
Hence, the required hour to fill the reservoir = 30 hours

Assignment: Write the solutions and solve Q.3, 6 & 7 of Ex. 11.3, Q1 of Ex.11.4 neatly in fair copy.