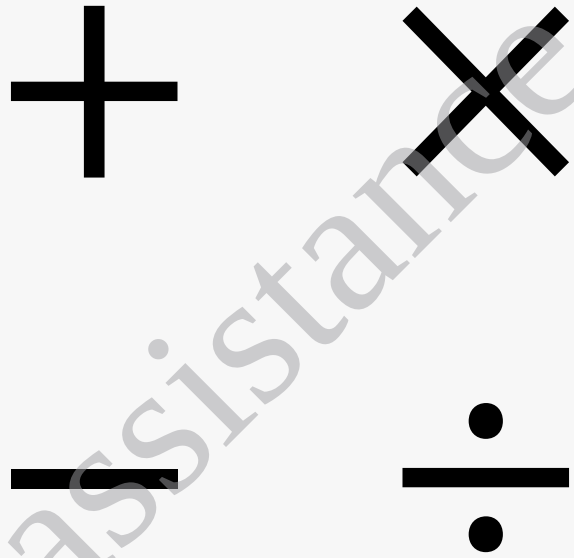
Volume And Surface Area
Ex. 15.1



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Ex. 15.1

1. Length of cuboid, $l = 15$ cm
Width of cuboid, $b = 12$ cm
Height of cuboid, $h = 10$ cm
Volume of cuboid $= l\,b\,h$
$= 15 \times 12 \times 10$
$= 180\ cm^3$

2. Length of water tank, $l = 2m\ 20\ cm = 2.2m$
$(1\ m = 100\ cm)$
Breadth of water tank, $b = 1m\ 85\ cm = 1.85\ m$
Depth of water tank, $h = 1m\ 10\ cm = 1.1\ m$
Volume of water tank $= l\,b\,h$
$= 2.2 \times 1.85 \times 1.1$
$= 4.477\ m^3$

3. Let height of cube be h cm
Length of cube $= 12$ cm
Breadth of cube $= 8$ cm
Volume of cube $= 384\ cm^3$
$l\,b\,h = 384$
or $12 \times 8 \times h = 384$
or $h = \frac{384^{32}4}{1\ \cancel{12} \times \cancel{8}\ 1}$
or $h = 4$
$\therefore$ Height of cuboid $= 4$ cm

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4. Length of pit, $l = 6$ cm
Breadth of pit, $b = 3$ cm
Depth of pit, $h = 9$ cm
Sand needed to fill the pit $= l\,b\,h$
$= 6 \times 3 \times 9$
$= 162\ cm^3$

5a. Edge of cube, $a = 17$ cm
Volume of cube $= a^3$
$= 17 \times 17 \times 17$
$= 4913\ cm^3$

b. Edge of cube, $a = 32$ m
Volume of cube $= a^3$
$= 32 \times 32 \times 32$
$= 32768\ cm^3$

6. Radius of cylinder, $r = 7$ cm
Let the height of cylinder $= h$ cm
Volume of cylinder $= 1024\ cm^3$
or $\pi r^2 h = 1024$
or $\frac{22}{7_1} \times \cancel{7}^{1} \times 7 \times h = 1024$
or $h = \frac{1024}{\frac{\cancel{22}}{11} \times 7}$ 512
or $h = \frac{512}{77}$
or $h \simeq 6.65$ $\therefore$ Height of cylinder $\simeq 6.65$ cm

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7. Edge of bigger cube, $A = 32$ cm
Edge of smaller cube, $a = 2$ cm
Number of cubes = $\frac{\text{volume of bigger cube}}{\text{volume of smaller cube}}$

$$= \frac{A^3}{a^3}$$

$$= \frac{32 \times 32 \times 32}{2 \times 2 \times 2}$$

$$= 4096$$

8. Area of floor $= 30\ m^2$
Let height of room $= h$ metre
Volume of room $= 120\ m^3$
or area of base $\times$ height $= 120$
or $30 \times h = 120$
or $h = \frac{120}{30}$
or $h = 4$
$\therefore$ Height of room $= 4$ m

9. Height of cylinder, $h = 35$ cm
Area of base $= 1386\ cm^2$
Volume of cylinder = area of base $\times$ height
$= 1386 \times 35$
$= 48510\ cm^3$

10. Diameter of well, $d = 120$ cm
Radius of well, $r = \frac{d}{2} = \frac{120}{2} = 60$ cm

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Depth of well, $h = 950$ cm

Volume of mud removed $= \pi r^2 h$

$= \frac{22}{7} \times 60 \times 60 \times 950$

$= \frac{22 \times 60 \times 60 \times 950}{7 \times 100 \times 100 \times 100}$ m^3

$(\because 1\ m = 100\ cm)$

$= \frac{7524}{700}$

$\approx 10.75 m^3$

11. Volume of oil in the container $= l b h$

$= 20 \times 30 \times 10$

$= 6000\ cm^3$

$= \frac{6000}{1000}$ l $(\because 1l = 1000\ cm^3)$

$= 6\ l$

Volume of oil poured out $= 2l\ 500ml$

$= 2.5l\ (\because 1l = 1000ml)$

Volume of oil left in the container $= 6 - 2.5$

$= 3.5l$

12. Height of pole, $h = 4m$

Diameter of pole, $d = 28$ cm

Radius of pole, $r = \frac{d}{2} = \frac{28}{2} = 14\ cm = 0.14m$

$(\because 1m = 100\ cm)$

Volume of iron $= \pi r^2 h$

$= \frac{22}{7} \times 0.14 \times 0.14 \times 4 = \frac{1.7248}{7}$

$= 0.2464\ m^3$

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Weight of 1 kg of iron = 50 kg

Weight of 1.7248 kg of iron = 50×0.2464

$= 12.32$ kg

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