WS-1 · Area and Volume

Tasks

① Given Area of a rectangle = 0.7 hectares
$= 0.7 \times 10^4 m^2$

Given one side let it be b = 60m.

∴ From Area. $= l \times b$

$\Rightarrow 7 \times 10^3 = 60 \times l. \Rightarrow l = \frac{7 \times 10^2}{6} = 1.666 \times 10^2$
$\simeq 167 m.$

② we know that area = $(side)^2$

If side is triple then area = $(3 side)^2$
$= 9 (side)^2$

So area becomes 9 times that of original area.

③ we know that area = $(side)^2$

If side is decreased to $\frac{1}{4}^{th}$ then area = $(\frac{1}{4} side)^2$
$= \frac{1}{16} (side)^2$

So area decreases to $\frac{1}{16}^{th}$ of original value.

④ $1 dm = 10^{-1} m = 0.1 m.$

Given side of a square = 4m 8dm = 4m + 8(0.1)
= 4.8 m

Then area = $(Side)^2 = (4.8)^2$
$= 23.04 m^2$

⑤ Given length $l = 40cm$; breadth $b = 15m$

Then area = $l \times b = 40 \times 15 \Rightarrow 600 cm^2$
$= 6 m^2$

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⑥ Given length $l = 12cm$; $b = 9cm$; $h = 5cm$

Then the volume of a cuboid $= l \times b \times h$

$= 12 \times 9 \times 5$

$\Rightarrow 540 cm^3$

⑦ Given $l = 30cm$; $b = 10cm$; $h = 5cm$

Then the volume of the book $V = l \times b \times h$

$= 30 \times 10 \times 5$

$\Rightarrow 1500\ cm^3$.

⑧ water level in a given cylinder $V_1 = 16.5\ ml$.

water level + stone $V_2 = 23\ ml$

$\therefore$ Volume of the stone $= V_2 - V_1$

$= 23 - 16.5 = 6.5\ ml$

⑨ water level in a cylinder $V_1 = 23\ ml$

water level with stone $V_2 = 60\ ml$.

$\therefore$ volume of the stone $= V_2 - V_1 = 60 - 23$

$= 37\ ml$.

⑩. A cube has side length $l = 1.6 \times 10^{-2} m$

$\therefore$ Volume of the cube $= (Side)^3$

$= (1.6 \times 10^{-2})^3$

$\Rightarrow (16 \times 10^{-3})^3$

$\Rightarrow 4096 \times 10^{-9}$

$\Rightarrow 4.096\ m^3$

⑮ (a) $s = 8cm \rightarrow$ area $= s^2 = 8^2 = 64 cm^2$

(b) $s = 16cm \rightarrow$ area $= s^2 = 16^2 = 256\ cm^2$

(c) $s = 5cm \rightarrow$ Area $= s^2 = 5^2 = 25\ cm^2$

(d) $s = 3\ cm \rightarrow$ Area $= s^2 = 3^2 = 9\ cm^2$

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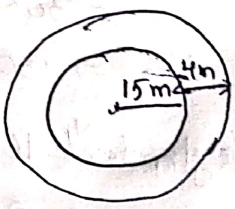
16. level of water in a cylinder $V_1 = 22.5\ ml$

level of water with stone is $V_2 = 41.0\ ml$

(i) The increase in water level = $V_2 - V_1 = 18.5\ ml$

(ii) Volume of stone $= V_2 - V_1 = 18.5\ m^3$

(17) 

$\therefore$ Radius of the Park $= 15 + 4 = 19\ m$

$\therefore$ Area of the Park $= \pi r^2$

$= 3.14 \times (19)^2$

$= 1133.54\ m^2$

(18) Given the volume of a cuboid $= 5400\ m^3$.

length $l = 30m$, breadth $b = 20m$ then $h = ?$

According to the volume of a cuboid

$V = l \times b \times h$

$\Rightarrow 5400 = 30 \times 20 \times h \Rightarrow h = 9m$

(19) Given Volume of a cylinder = Area of a sphere

$\Rightarrow \pi r^2 h = 4\pi r^2$

$\Rightarrow h = 4r \Rightarrow h = 4 \times 3$

$\Rightarrow h = 4m.$

[Here radius of cylinder = radius of sphere = 3m]

(20) Given $l = 150cm$; width $= 90cm$

Area of the paper $A = l \times w = 150 \times 90\ cm^2$

They gave dimensions $[l, w]$ of envelope as 10cm & 4cm

So area of envelope $a = 10cm \times 4cm$.

$\therefore$ No. of envelopes made with Paper = $\frac{\text{Area of Paper}}{\text{Area of Each envelope}}$

$N = \frac{150 \times 90}{10 \times 4} = \frac{405}{}$

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LTask SAQ's

(1) Volume of oil in a pot $V = 2.85\ m^3$

capacity of each bottle $v = 300\ ml$.

$1ml = 10^{-3}\ m^3$.

No. of bottles $N = \dfrac{\text{volume of oil}}{\text{capacity of each bottle}}$

$N = \dfrac{2.85}{300 \times 10^{-3}} = \dfrac{2850}{300 \times 10^{-3}} = 9.5 \times 10^3$

$N = 9500$

(2) unit of volume = cm^3 (or) m^3.

unit of area = cm^2 (or) m^2.

$\therefore \dfrac{\text{unit of volume}}{\text{unit of area}} = \dfrac{cm^3}{cm^2}$ (or) $\dfrac{m^3}{m^2}$

= cm (or) m which is the unit of length.

(3) Given side length $= 1.5 \times 10^{-2}\ m$.

$\therefore$ volume of cube = $(\text{side length})^3 = (1.5 \times 10^{-2})^3$

$= (.15 \times 10^{-3})^3 = 15^3 \times 10^{-9}$.

$= 3.375 \times 10^{-6}\ m^3$

(4) volume of stone $V_1 = 40\ cm^3$

volume of water $V_2 = 100\ cm^3$

After stone was dropped in water, the level of water rises and becomes $= V_1 + V_2$

$= 40 + 100$

$= 140\ cm^3$

⑤ Given radius $r = 7m$

volume of sphere $V = \frac{4\pi}{3} r^3$

$= \frac{4}{3} \times \frac{22}{7} \times (7)^3$

$\Rightarrow \frac{88}{3} \times 7^2 = \frac{88}{3} \times 49$

$= 1436 m^3$

⑥ Given Area $A = 225 m^2$.

Area of a square $= 225 m^2$

$\Rightarrow (\text{side})^2 = (15)^2$

$\Rightarrow$ side $= 15m$.

⑦ Given base $= 6m$; height $= 10m$.

Then area of a triangle $= \frac{1}{2} \times$ base $\times$ height

$= \frac{1}{2} \times 6m \times 10m$

$= 30 m^2$

⑧ Given area of a cylinder $= 81 m^2$; height $= 1m$

$\pi r^2 h = 81$

$\Rightarrow 3.14 \times r^2 \times 1 = 81$

$\Rightarrow r^2 = \frac{81}{3.14} \Rightarrow r = 5.07 m$

⑨ Given $r = 5m$

Area of sphere $= 4\pi r^2$

$= 4 \times 3.14 \times 5^2$

$\Rightarrow 100 \times 3.14$

$= 314 m^2$

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(10) breadth = 4m. $l = 3b = 3 \times 4$

$l = 12m$.

$\therefore$ Area of rectangle $= l \times b$

$= 4 \times 12$

$= 48m^2$

(16) Volume of ~~Med~~. Tonic $V_1 = 480ml$

capacity of each spoon = 4ml.

(i) Volume of tonic consumed by ~~dav~~ David per day $V_2 = 3$ spoons

$= 3 \times 4ml$

$V_2 = 12ml$.

(ii) No. of days that David had to taken

$$\text{Tonic} = N = \frac{\text{volume of Tonic } V_1}{V_2}$$

$$N = \frac{480}{12} = 40 \text{ days.}$$

(iii) $4ml = 4 \times 10^{-3} lit$

(17) length of reading room = 6m

breadth = 6.5m.

$\therefore$ Area of reading room $= l \times b = 6 \times 6.5 = 39m^2$

(18) Given For reading table $l = 2.5$

Area = $8.5m^2$

$\Rightarrow b \times l = 8.5m^2$

$\Rightarrow b \times 2.5 = 8.5$ 3.4m

$b = 3.4m$

(19) For Geometry box

$l = 0.42m$; $b = 0.15m$; Area $= lb$

$= 0.42 \times 0.15$

$= 0.063m^2$

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(21) Given volume of sphere $V = 1889\ m^3$

$$\Rightarrow \frac{4\pi}{3} r^3 = 1889$$

$$\Rightarrow \frac{4 \times 3.14}{3} r^3 = 1889$$

$$\Rightarrow r^3 = (7.66\ m)^3$$

$$\Rightarrow r = 7.66\ m$$

(22) Given Area of triangle $= 40\ m^2$; base $= 10m$

$$\Rightarrow \frac{1}{2} \times \text{base} \times \text{height} = 40\ m^2$$

$$\Rightarrow \frac{1}{2} \times 10 \times h = 40$$

$$\Rightarrow h = 8\ m$$