WS-4 Foundation 6th class

Task

① Given radius = 1m

height = 2m

Volume = $\pi r^2 h$

$= \pi (1)^2 \times 2$

$= 2\pi$

② $l = 30m$; $b = 5m$; $h = 2m$

volume of cuboid = lbh

$= 30 \times 5 \times 2$

$= 300\ m^3$

③ $h = 2m$; Volume $= 50\pi\ m^3$

volume of cylinder $V = \pi r^2 h$

$\Rightarrow 50\pi = \pi r^2 (2)$

$\Rightarrow r^2 = 25$

$\Rightarrow r = 5m$

④ Given $l = 4m$, $b = 6m$; $h = x m$

Volume $= 48$

$\Rightarrow lbh = 48$

$\Rightarrow 4 \times 6 \times h = 48$

$\Rightarrow h = 2m$

$\therefore x = 2m$

⑤ $h_1 = 6m$; $r = 2m$

$h_2 = \frac{h_1}{2} = 3m$; $r_2 = 2r_1 = 4m$

change in volume $= V_2 - V_1$

$= \pi r_2^2 h_2 - \pi r_1^2 h_1$

$\Rightarrow \pi [r_2^2 h_2 - r_1^2 h_1]$

$\Rightarrow \pi [4^2 \times 3 - 2^2 \times 6]$

$= \pi [48 - 24]$

$= 24\pi$

⑥ $\frac{V_1}{V_2} = \frac{27}{1}$

$\therefore \frac{\frac{4\pi}{3} r_1^3}{\frac{4\pi}{3} r_2^3} = \frac{27}{1}$

$\Rightarrow \left[\frac{r_1}{r_2}\right]^3 = \left[\frac{3}{1}\right]^3$

$\Rightarrow \frac{r_1}{r_2} = \frac{3}{1}$

(7)

height = 2m

Area = 5 m²

volume = $\pi r^2 h$

= Asea x h

= 5 x 2

= 10 m³

(8)

$r_1 = 2m$: $r_2 = 4m$: $h_1 = h_2$

$\frac{V_1}{V_2} = \frac{\pi r_1^2 h_1}{\pi r_2^2 h_2} = \left[\frac{r_1}{r_2}\right]^2$

$\frac{V_1}{V_2} = \left[\frac{2}{4}\right]^2 = \frac{1}{4}$.

(9)

$\frac{V_1}{V_2} = \frac{2}{1}$; $r_1 = r_2$

$\therefore \frac{\pi r_1^2 h_1}{\pi r_2^2 h_2} = \frac{2}{1}$

$\Rightarrow \frac{h_1}{h_2} = \frac{2}{1}$

(10)

Volume = 660 cm³ : h = 35 cm

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

$\Rightarrow 660 = \frac{22}{7} r^2 \times 35\ 5$

$\Rightarrow 30 = 5r^2$

$\Rightarrow r = \sqrt{6}$ cm

(11)

(a) Diagonal of cube = $\sqrt{3}$ a

'a' in side of cube

(c) volume of cube = (Side)³

= Product of three sides

(b) volume of cylinder = Area x height

(13)

If 'd' in diagonal of cube

then volume = $\frac{\sqrt{3}}{4} d^2$

volume of sphere = $\frac{4\pi}{3} r^3$; cube = (Side)³

(14)

$r_1 = 2m$; $r_2 = 1m$

$h_1 = h_2 = 4m$

$V_1 - V_2 = \pi r_1^2 h_1 - \pi r_2^2 h$

$= \pi [2^2 \times 4 - 1^2 \times 4]$

$= \pi (16 - 4) = 12\pi$

(15)

(15)

$r_1 = 3m$; $r_2 = 1m$

$\Delta V = \frac{4\pi}{3}[r_1^3 - r_2^3]$

$= \frac{4\pi}{3}[3^3 - 1^3]$

$= \frac{4\pi}{3}[27 - 1]$

$= 26 \times \frac{4\pi}{3}$

$= \frac{104}{3}\pi$

(16)

Given.

Volume of cylinder = volume of sphere

$\Rightarrow \pi r^2 h = \frac{4\pi}{3} r^3$

$\Rightarrow h = \frac{4}{3} r$

(17)

Side = 0.5 m

volume of cube = $(\text{Side})^3$

$= (0.5)^3$

$= 125 \times 10^{-3}\ m^3$

(18)

Area = 20 m^2

h = 10 m

volume = Area × h

$= 20 \times 10$

$= 200\ m^3$

(19)

$r = 4m$; $h = 10m$

volume of cylinder = $\pi r^2 h$

$= \pi \times (4)^2 \times 10$

$= 160\pi$

L Task

SAQ's

(1)

volume $= 20m^3$; $r = 2m$

$\Rightarrow \pi r^2 h = 20$

$\Rightarrow \pi 2^2 h = 20$

$\Rightarrow 4\pi h = 20$

$\Rightarrow h = \frac{20}{4\pi} = \frac{5}{\pi}\ m$

(2) Given $l = b$; $h = 2m$

Volume of cuboid = lbh

$\Rightarrow 25 = l \times l \times 2$

$\Rightarrow l^2 = 25$

$\Rightarrow l = 5m \Rightarrow b = 5m$

(3)

$r = 3\,m$

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

$= \frac{4\pi}{3} (3)^3$

$= 4\pi \times 3^2$

$= 36\pi$

(4)

$h = 2r$: volume $= 16\pi$

volume of cylinder: $\pi r^2 h$

$\Rightarrow 16\pi = \pi r^2 (2r)$

$\Rightarrow 16 = 2r^3$

$\Rightarrow 8 = r^3$

$\Rightarrow r = 2\,m$

(5)

Given $a_1 = 2a_2$

volume of cube $= a^3$

$\Rightarrow \frac{V_1}{V_2} = \left(\frac{a_1}{a_2}\right)^3$

$\Rightarrow \frac{V_1}{V_2} = \left[\frac{2a_2}{a_2}\right]^3$

$= \frac{2^3}{1} = \frac{8}{1}$

(6)

volume of sphere $= 16\pi$

$\Rightarrow \frac{4\pi}{3} r^3 = 16\pi\, 4$

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

$\Rightarrow r^3 = 12$

$\Rightarrow r = \sqrt[3]{12}$

(7)

Diagonal cube $= 3\,m$

$\Rightarrow \sqrt{3}\, a = 3$

$\Rightarrow a = \sqrt{3}\,m$

(8)

$\frac{V_1}{V_2} = \left[\frac{r_1}{r_2}\right]^3$

$\Rightarrow \frac{16\pi}{2\pi} = \left[\frac{r_1}{r_2}\right]^3$

$\Rightarrow \frac{8}{1} = \left[\frac{r_1}{r_2}\right]^3 \Rightarrow \frac{r_1}{r_2} = \frac{2}{1}$

(9)

Side $= 1\,m$

Diagonal length $= \sqrt{3} \times$ side

$= \sqrt{3} \times 1$

$= \sqrt{3}\,m$

$= (3\sqrt{3})^{\frac{1}{3}}$

(10)

(10)

volume of sphere = volume of cylinder

$$\frac{4\pi}{3} r^3 = \pi r^2 h$$

$$\Rightarrow \frac{4r}{3} = h$$

$$\Rightarrow 2r = \frac{3}{2} h \quad ; \quad 3 \times \frac{10}{2} = 15 \text{ m}$$

(11)

(a) volume of sphere $= \frac{4\pi}{3} r^3$; volume of hemisphere $= \frac{2\pi}{3} r^3$

(b) If $r = 3$ m ; volume $= \frac{4\pi}{3}(r)^3 = \frac{4\pi}{3}(3)^3 = 36\pi$.

(13)

$l_1 = 2$m ; $b_1 = 3$m ; $h_1 = 4$m

$l_2 = 4$m ; $b_2 = 3$m ; $h_2 = 2$m

Change in volume $= (l_1 b_1 h_1 \sim l_2 b_2 h_2)$

$= 2 \times 3 \times 4 \sim 4 \times 3 \times 2$

$= 0$

(14)

$a_1 = 4$m ; $a_2 = \frac{1}{2} a_1 = 2$m

$$\frac{V_1}{V_2} = \left[\frac{a_1}{a_2}\right]^3 = \left[\frac{4}{2}\right]^3$$

$$= \frac{8}{1}$$

(15)

$a_1 = 2$m, $l = 2$m, $b = 1$m

Volume of cuboid = volume of cube

$\Rightarrow lbh = a^3$

$\Rightarrow 2 \times 1 \times h = 2^3$

$\Rightarrow h = 2^2 = 4$ m

(16)

$l = 1$m, $b = 2$m, $h = (k+1)$m

$V = 14$ m^3

$lbh = 14$

$\Rightarrow 1 \times 2 (k+1) = 14$ 7

$\Rightarrow k+1 = 7$

$\Rightarrow k = 6$ m

(17)

$r = 1m$

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

$= 4 \frac{\pi}{3} (1)^3$

$= \underline{4} \frac{\pi}{3} m^3$