

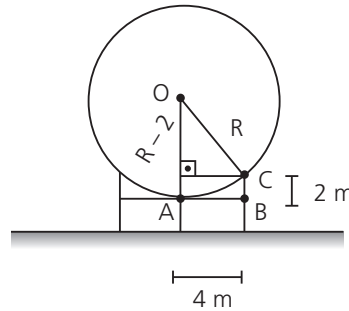
01.

$$I. R^2 = (R-2) + 4^2$$

$$R^2 = R^2 - 4R + 4 + 16$$

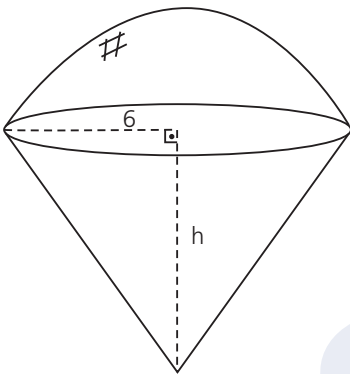
$$4R = 20 \rightarrow \boxed{R=5}$$

$$II. V_{\text{esfera}} = \frac{4}{3} \pi R^3 \rightarrow V = \frac{4}{3} \pi (5)^3 \rightarrow \boxed{V \approx 523,3 \text{ m}^3}$$



Resposta: C

02.



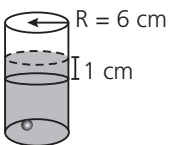
$$\frac{1}{2} \cdot \frac{4}{3} \pi \cdot 6^3 + \frac{\pi \cdot 6^2 \cdot h}{3} = 288\pi$$

$$144 + 12h = 288$$

$$\boxed{h=12}$$

Resposta: D

03.



$$V_{\text{subiu}} = V_{\text{Esfera}}$$

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

$$(6)^2 \cdot 1 = \frac{4}{3} r^3$$

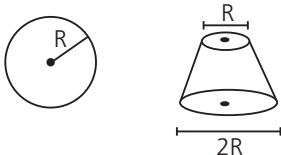
$$\boxed{r=3 \text{ cm}}$$

Resposta: C

$$04. \text{ Razão (pedida)} = \frac{V(\text{água doce superficial})}{V(\text{água doce do planeta})} = \frac{104,59 \cdot 10^3 \text{ km}^3}{35,03 \cdot 10^6 \text{ km}^3} \approx \frac{3}{1000} \approx \frac{1}{345}$$

Resposta: A

05.



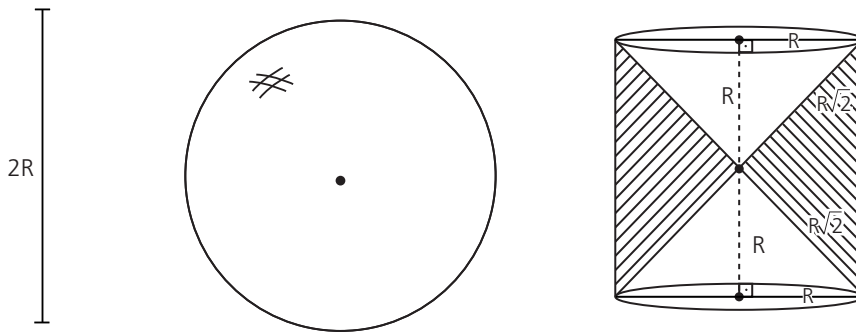
$$V_{\text{esfera}} = V_{\text{Tronco Cone}}$$

$$\frac{4}{3} \pi R^3 = \frac{H \pi}{3} \left(R^2 + R \cdot \frac{R}{2} + \left(\frac{R}{2} \right)^2 \right) \rightarrow 4R^3 = H \left(\frac{4R^2 + 2R^2 + R^2}{4} \right)$$

$$16R^3 = H \times 7R^2 \rightarrow \boxed{H = \frac{16R}{7}}$$

Resposta: A

06.



$A_1 = \text{Área (anticlepsidra)} = \text{lateral (cilindro)} + 2 \text{ lateral (cone)}$

Então: $A_1 = 2\pi R \cdot 2R + (\pi R \cdot R\sqrt{2}) \cdot 2 = 4\pi R^2 + 2\pi R^2\sqrt{2}$

Logo: $\frac{A_{\text{esfera}}}{A_{\text{anticlepsidra}}} = \frac{4\pi R^2}{4\pi R^2 + 2\pi R^2\sqrt{2}} = 2 - \sqrt{2}$

Resposta: D

07. Temos que:

$V_{\text{anticlepsidra}} = V_{\text{esfera}} = \frac{4}{3}\pi R^3 = \pi$

Então: $R^3 = \frac{3}{4} = \frac{6}{8}$

Logo: $R = \frac{\sqrt[3]{6}}{2}$

Resposta: B

08. Temos:

$27 \cdot \left(\frac{4}{3}\pi \cdot 4^3\right) \rightarrow 1\ell \text{ (suco concentrado)}$

$n \cdot \left(\frac{4}{3}\pi \cdot 3^3\right) \rightarrow 1\ell \text{ (suco concentrado)}$

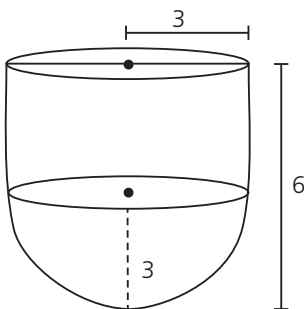
Então:

$n \cdot \left(\frac{4}{3}\pi \cdot 3^3\right) = 27 \cdot \left(\frac{4}{3}\pi \cdot 4^3\right)$

$n = 4^3 = 64.$

Resposta: C

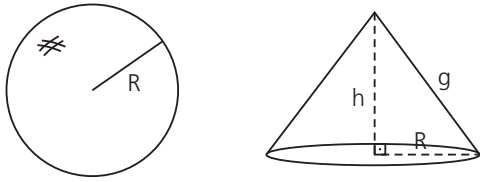
09.



$V(\text{reservatório}) = \underbrace{\pi \cdot 3^2 \cdot 3}_{\text{cilindro}} + \underbrace{\frac{1}{2} \cdot \frac{4}{3} \cdot \pi \cdot 3^3}_{\text{semiesfera}} = 45\pi \text{m}^3$

Resposta: E

10. Do enunciado, tem-se:



- Área (esfera) = $256 \pi \text{ cm}^2 \rightarrow 4\pi R^2 = 256\pi \rightarrow R = 8$
- Geratriz $\rightarrow \frac{5}{4} R \rightarrow g = \frac{5}{4} \cdot 8 = 10$
- Pitágoras $\rightarrow g^2 = h^2 + R^2 \rightarrow h = 6$

Logo:

$$\text{Razão (desejada)} = \frac{V_{\text{cone}}}{V_{\text{esfera}}} = \frac{\frac{\pi R^2 \cdot h}{3}}{\frac{4}{3} \pi R^3} = \frac{h}{4R}$$

$$\text{Razão (desejada)} = \frac{6}{32} = \frac{3}{16}$$

Resposta: C

