Tarefa Básica – Esferas

01. (c)

02. $V = 4/3 \pi R^3$

$V_1 = 4/3 \ \pi \cdot 1^3 = 4/3 \cdot \pi \qquad V_2 = 4/3 \cdot R^3$

$\dfrac{4\pi r^3}{3} = 1000000 \cdot \dfrac{4\pi}{3} \rightarrow r^3 = \sqrt[3]{1000000}$

$\boxed{r = 100}$

03. $V_e = \dfrac{4\pi R^3}{3}$

$V_c = \pi(2R)^2 \cdot h$

$V_c = \pi(2R)^2 \cdot 4R$

$\dfrac{\frac{4\pi R^3}{3}}{\pi(2R)^2 \cdot 4R} \cdot \dfrac{1}{1} \rightarrow \dfrac{4\pi R^3}{\pi 4R^2 \cdot 12R} \rightarrow \dfrac{4R^3}{48R^3} = \boxed{\dfrac{1}{12}}$ (E)

04. $V_{e_1} = \dfrac{4\pi 1^3}{3} = \dfrac{4\pi}{3} \ cm^3 \qquad V_+ = \dfrac{32\pi}{3} + \dfrac{4\pi}{3} = \dfrac{36\pi}{3} = 12\pi \ cm^3$

$V_{e_2} = \dfrac{4\pi 2^3}{3} = \dfrac{32\pi}{3} \ cm^3$

(B)
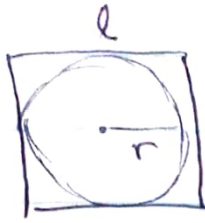
$V_c = \pi r^2 \cdot h \rightarrow 12\pi = \pi r^2 \cdot 3 \rightarrow r^2 = 12/3 \rightarrow r = \sqrt{4} \rightarrow \boxed{r = 2 \, cm}$

05. $V_c = \pi 6^2 \cdot 1 \qquad \dfrac{4\pi r^3}{3} = 36\pi$

$V_c = 36\pi \ cm^3$

$V_e = \dfrac{4\pi r^3}{3} \qquad 4\pi r^3 = 108\pi$

$r = \sqrt[3]{27}$

$\boxed{r = 3 \, cm}$ (c)

06.

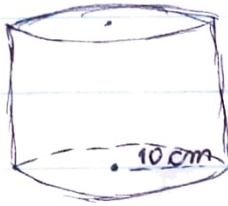$$288\pi = \frac{4\pi r^3}{3}$$

$$4r^3 = 864$$

$$r^3 = 216$$

$$r = 6\,cm$$

$\ell = 2r$

$\ell = 2 \cdot 6$

$\boxed{\ell = 12\,cm}$ (E)

07.

16 cm

10 cm

$$V_C = \pi \cdot 10^2 \cdot 16$$

$$V_C = 1600\pi$$

$$V_d = \frac{4\pi 2^3}{3}$$

$$V_d = \frac{32\pi}{3}$$

$$1600\pi = X \cdot \frac{32\pi}{3}$$

$$4800\pi = 32\pi x \qquad X = \frac{4800}{32} \qquad \boxed{x = 150 \ doces} \quad (D)$$

08. $\frac{4}{3} \cdot \pi r^3 = 2\pi r^2 H = 2 \cdot \frac{1}{3}\pi r^2 h$

$\qquad \frac{4}{3} \cdot r^3 = 2r^2 H = 2 \cdot \frac{1}{3} r^2 h \qquad (\times 3)$

$\qquad 4r^3 = 6r^2 H = 2 r^2 \cdot h \qquad (\div 2)$

$\qquad 2r^3 = 3r^2 H = r^2 h \qquad (\div r^2)$

$\qquad \boxed{2r = 3H = h} \ (D)$
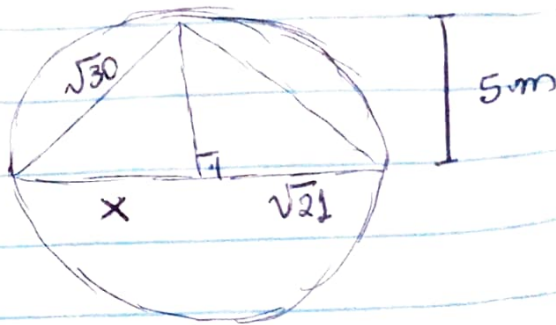
Tarefa Básica - Inscrição e circunscrição de sólidos

01. $A_e = 4\pi r^2$

$100\pi = 4\pi r^2$

$r^2 = 25$

$r = 5\ m$

geratriz $= \sqrt{30}\ m$

$(\sqrt{30})^2 = h^2 + (\sqrt{21})^2$

$30 = h^2 + 21$

$h^2 = 9$

$\boxed{h = 3\ m}$

$(\sqrt{30})^2 = 3^2 + x^2$

$30 = 9 + x^2$

$x^2 = 21$

$x = \sqrt{21}$

02. $A_e = 4\pi r^2 \qquad a \to aresta$

$A_c = 6\ell^2 \qquad r = a/2$

$A_e = 4\pi \left(\dfrac{a}{2}\right)^2 = \pi a^2 \qquad A_c = 6\ell^2 = 6a^2$

$\dfrac{A_e}{A_c} = \dfrac{\pi a^2}{6a^2} = \boxed{\dfrac{\pi}{6}} \qquad (A)$

03. $R = d/2$

$R = \dfrac{a\sqrt{3}}{2}$

$\dfrac{V_e}{V_c} = \dfrac{\dfrac{4\pi R^3}{3}}{a^3} = \dfrac{\dfrac{4\pi \left(\frac{a\sqrt{3}}{2}\right)^3}{3}}{a^3}$

$= \dfrac{\dfrac{4\pi}{3} \cdot \dfrac{a^3 \cdot 3\sqrt{3}}{8}}{a^3} = \dfrac{12\sqrt{3}\,\pi}{24} = \boxed{\dfrac{\sqrt{3}}{2}\,\pi} \quad (B)$

04. $\dfrac{2r}{3r} = \dfrac{12}{3}$
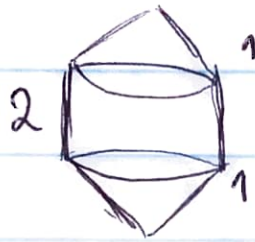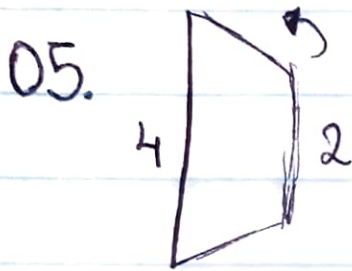
$6r = 36 - 12r$

$18r = 36$

$r = 2\,m$

$V_c = \pi r^2 \cdot (2r)$

$V_c = \pi 2^2 \cdot (2 \cdot 2)$

$V_c = 4\pi \cdot 4$

$\boxed{V_c = 16\pi\,m^3}$

05.

$V_{cone} = \dfrac{\pi r^2 h}{3} = \dfrac{\pi}{3} \cdot 1 \cdot 1 = \dfrac{\pi}{3}$

$\dfrac{\pi}{3} \cdot 2 = \dfrac{2\pi}{3}$

$V_{cil} = 2\pi r^3 = 2\pi \cdot 1^3 = 2\pi$

$V = \dfrac{2\pi}{3} + 2\pi = \dfrac{6\pi + 2\pi}{3} = \dfrac{8\pi}{3}$