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Sala: CTII 317

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$$1) V_{\text{cone grand}} = \frac{1}{3} \pi \cdot r^2 \cdot h$$

$$V_{\text{cone grand}} = \frac{\pi \cdot 3^2 \cdot 8}{3}$$

$$V_{\text{cone grand}} = \frac{\pi \cdot 3 \cdot 3 \cdot 8}{3}$$

$$V_{\text{cone grand}} = 24\pi \text{ cm}^3$$

$$V_{\text{cone peque}} = \frac{1}{2} \cdot V_{\text{cone grand}}$$

$$V_{\text{cone peque}} = \frac{1}{2} \cdot 24\pi$$

$$V_{\text{cone peque}} = 12\pi \text{ cm}^3$$

$$\frac{V_{\text{cone grand}}}{V_{\text{cone peque}}} = \left(\frac{h_{\text{cone grand}}}{h_{\text{cone peque}}} \right)^3$$

$$\frac{24\pi}{12\pi} = \frac{8^3}{h^3}$$

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

$$2h^3 = 8^3$$

$$h^3 = \frac{512}{2}$$

$$h^3 = 256$$

$$h = \sqrt[3]{256}$$

$$h = 4\sqrt[3]{4}$$

$$2) \frac{V_{\text{liqui}}}{V_{\text{tot}}} = \left(\frac{16}{20} \right)^3$$

$$\frac{V_{\text{lia}}}{V_{\text{tot}}} = \left(\frac{8}{10} \right)^3$$

$$\frac{V_{\text{liqui}}}{V_{\text{tot}}} = \frac{512}{1000} \div 10$$

$$\frac{V_{\text{liqui}}}{V_{\text{tot}}} = \frac{51,2}{100}$$

$$\frac{V_{\text{liqui}}}{V_{\text{total}}} = 51,2\%$$

$$V_{\text{liqui}} = 51,2\% \cdot V_{\text{tot}}$$

$$V_{\text{espum}} + V_{\text{liqui}} = 100\% \cdot V_{\text{tot}}$$

$$V_{\text{espum}} + 51,2\% \cdot V_{\text{tot}} = 100\% \cdot V_{\text{tot}}$$

$$V_{\text{espum}} = 100\% \cdot V_{\text{tot}} - 51,2\% \cdot V_{\text{tot}}$$

$$V_{\text{espum}} = 48,8 \text{ de } V_{\text{tot}} \text{ letra C}$$

6) h ?

$$g^2 = h^2 + (R-r)^2 \quad \rightarrow h = \sqrt{9}$$

$$5^2 = h^2 + (7-3)^2 \quad h = 3$$

$$25 = h^2 + 4^2$$

$$25 = h^2 + 16$$

$$h^2 = 25 - 16$$

$$h^2 = 9$$

Volume:

$$V = \frac{(\pi \cdot h)}{3} \cdot (R^2 + R \cdot r + r^2) \quad \rightarrow V = 79\pi \text{ cm}^3$$

$$V = \frac{\pi \cdot 3}{3} \cdot (7^2 + 7 \cdot 3 + 3^2) \quad \text{letra D}$$

$$V = \frac{\pi \cdot 3}{3} \cdot (49 + 21 + 9)$$

$$V = \pi \cdot 79$$

7) Raio cone menor:

$$\frac{R}{H} = \frac{r}{h}$$

$$r = \frac{Rh}{H}$$

Volume cone grande:

$$V_{\text{grande}} = \frac{\pi R^2 H}{3}$$

Volume cone pequena:

$$V_{\text{peque}} = \frac{\pi \left(\frac{Rh}{H}\right)^2 h}{3} = \frac{\pi R^2 h^3}{3H^2}$$

Volume tronco de cone:

$$V_T = V_{\text{grande}} - V_{\text{peque}}$$
$$V_T = \frac{\pi R^2 H}{3} - \frac{\pi R^2 h^3}{3H^2}$$

$$V_T = \frac{\pi R^2 (H^3 - h^3)}{3H^2}$$

Tronco = Cone menor

$$\frac{\pi R^2 h^3}{3H^2} = \frac{\pi R^2 (H^3 - h^3)}{3H^2}$$

$$\pi R^2 h^3 = \pi R^2 (H^3 - h^3)$$

$$h^3 = H^3 - h^3$$

$$2h^3 = H^3$$

$$h^3 = \frac{H^3}{2}$$

$$h = \sqrt[3]{\frac{H^3}{2}}$$

$$h = \frac{\sqrt[3]{H^3}}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2^3}}{\sqrt[3]{2^3}}$$

$$h = \frac{H \sqrt[3]{2^2}}{\sqrt[3]{2} \sqrt[3]{2^2}}$$

$$h = \frac{H \sqrt[3]{2^2}}{\sqrt[3]{2 \cdot 2^2}}$$

$$h = \frac{H \sqrt[3]{4}}{\sqrt[3]{2^3}}$$

$$h = \frac{H \sqrt[3]{4}}{2} \quad \text{letra A}$$

1) letra c "pela rotação de um semi-círculo em torno do seu diâmetro."

O semi-círculo possui a linha e toda a parte de dentro. Quando fecha e faz a rotação, obtém-se uma esfera.

$$2) V = \frac{4}{3} \pi R^3$$

$$V_{\text{raio 1}} = \frac{4}{3} \pi R^3$$

$$V_{\text{raio 1}} = \frac{4}{3} \pi$$

$$V_2 = \frac{4}{3} \pi R^3$$

$$\frac{4}{3} \pi R^3 = 1,000,000 \cdot \frac{4}{3} \pi$$

$$R^3 = 10^6$$

$$R = \sqrt[3]{10^6}$$

$$R = 10^2$$

$$R = 100$$

$$3) V_{\text{esfer}} = \frac{4}{3} \pi R^3 = \frac{4 \pi R^3}{3}$$

$$V_{\text{cilin}} = \pi r^2 h \quad \text{radio} = 2R ; \text{altura} = 4R$$

$$V_{\text{cilin}} = \pi (2R)^2 \cdot 4R$$

$$V_{\text{cilin}} = \pi 4R^2 \cdot 4R$$

$$V_{\text{cilin}} = 16 \pi R^3$$

$$\frac{4 \pi R^3}{3}$$

$$16 \pi R^3$$

$$\frac{4 \pi R^3}{3} \cdot \frac{1}{16 \pi R^3}$$

$$4 \pi R^3 \cdot 1$$

$$3 \cdot 16 \pi R^3$$

$$4$$

$$3 \cdot 16$$

$$\frac{4}{48}$$

$$\frac{1}{12} \text{ letra E}$$

$$4) \frac{4 \pi r^3}{3}$$

$$\frac{4 \pi 1^3}{3} + \frac{4 \pi 2^3}{3} = \pi r^2 \cdot 3$$

$$\frac{4 \pi}{3} + \frac{4 \pi \cdot 8}{3} = 3 \pi r^2$$

$$\frac{4 \pi}{3} + \frac{32 \pi}{3} = 3 \pi r^2$$

$$\frac{36 \pi}{3} = 3 \pi r^2$$

$$12 \pi = 3 \pi r^2$$

$$r^2 = \frac{12 \pi}{3 \pi}$$

$$r^2 = 4$$

$$r = \sqrt{4}$$

$$r = 2 \text{ cm letra B}$$

$$5) V_{cilin} = \pi \cdot r^2 \cdot h$$

$$V_{cilin} = \pi \cdot 6^2 \cdot 1$$

$$V_{cilin} = \pi \cdot 36$$

$$V_{cilin} = 36\pi$$

$$V_{esfera} = \frac{4}{3} \pi r^3$$

$$\frac{4}{3} \pi r^3 = 36\pi$$

$$\div 4 \quad \div 4 \quad \div 4$$
$$\cancel{4} \pi r^3 = \cancel{108} \pi$$

$$r^3 = 27$$

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

$$r = 3$$

letra C

$$6) V_{\text{esfera}} = \frac{4}{3} \pi r^3$$

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

$$\cancel{\div 4} \pi r^3 = \cancel{864} \pi$$

$$r^3 = 216$$

$$r = \sqrt[3]{216}$$

$$r = 6$$

diâmetro = aresta do cubo

$$a = 2r$$

$$a = 2 \cdot 6$$

$$a = 12 \text{ cm letra E}$$

7) Panela:

$$V_{cilin} = \pi r^2 h$$

$$V_{cilin} = \pi \cdot 10^2 \cdot 16$$

$$V_{cilin} = \pi \cdot 100 \cdot 16$$

$$V_{cilin} = 1600\pi$$

$$V_{esfera} = \frac{4}{3} \pi 2^3$$

$$V_{esfera} = \frac{4}{3} \pi 8$$

$$V_{esfera} = \frac{32\pi}{3}$$

Doce:

$$V_{esfera} = \frac{4}{3} \pi r^3$$

$$\text{num doces} = \frac{V_{panela}}{V_{doce}}$$

$$\text{num doces} = \frac{1600 \cdot \pi}{\frac{32 \pi}{3}} =$$

$$\text{num doces} = 1600 \pi \cdot \frac{3}{32 \pi}$$

$$\text{num doces} = 50 \cdot 3$$

$$\text{num doces} = 150 \text{ litra D}$$

2) A superfície cubo = $6 \cdot l^2 \rightarrow S_{\text{esfera}} = \pi \cdot a^2$

Área S. cubo = $6 \cdot a^2$

$\frac{S_{\text{esfera}}}{S_{\text{cubo}}} = \frac{\pi \cdot a^2}{6 \cdot a^2}$

$\frac{S_{\text{esfera}}}{S_{\text{cubo}}} = \frac{\pi}{6}$ letra A

Raio esfera = $\frac{a}{2}$

$S_{\text{esfera}} = 4\pi r^2$

$S_{\text{esfera}} = 4\pi \cdot \left(\frac{a}{2}\right)^2$

$S_{\text{esfera}} = 4\pi \cdot \frac{a^2}{4}$

3) $V_{\text{esfera}} = \frac{4}{3} \pi \cdot r^3$; $V_{\text{cubo}} = a \cdot a \cdot a$; $R = \frac{a\sqrt{3}}{2} \rightarrow$ metade da diagonal

$\frac{\frac{4}{3} \pi \cdot \left(\frac{a\sqrt{3}}{2}\right)^3}{a^3}$

$\frac{\pi \cdot a^3 \sqrt{3}}{2 a^3}$

$\frac{\frac{4}{3} \pi \cdot a^3 \cdot 3\sqrt{3}}{8 a^3}$

$\frac{a^3 \sqrt{3} \pi}{2 a^3}$

$\frac{4\pi \cdot a^3 \sqrt{3}}{8 a^3}$

$\frac{\sqrt{3} \pi}{2}$ letra B