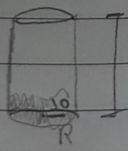
Giovanna Santana Pennisi - CTII 350

Lista de Exercícios - Aula 31

Lista de Exercícios – Cilindros

1 – Cilindro 1:



$40\text{ cm} = H$

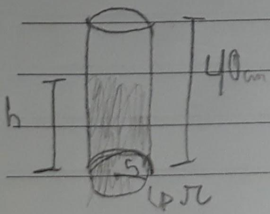
Volume cilindro 1 $= \pi \cdot R^2 \cdot H$

$V_1 = \pi \cdot 10^2 \cdot 40$

$V_1 = 4000\pi \text{ cm}^3$

↳ capacidade total

Cilindro 2:



$V_2 = \frac{1}{5} \cdot V_1$

$\pi \cdot r^2 \cdot h = \frac{1}{5} \cdot 4000\pi$

$\pi \cdot 5^2 \cdot h = \frac{4000\pi}{5}$

$25\pi \cdot h = 800\pi$

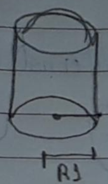
$h = \frac{800\pi}{25\pi}$

$h = 32 \text{ cm}$

Alternativa (A)

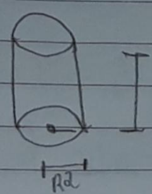
2 – Diâmetro = 2 · raio

C_1:



$2 \cdot (R_1)$

C_2:



$8 \cdot 2 \cdot (R_2) = 16(R_2)$

$\frac{(R_1)}{(R_2)} = ?$

$\frac{\text{Volume } C_1}{\text{Volume } C_2} = \frac{1}{27}$

$\frac{\cancel{\pi}(R_1)^2 \cdot 2 \cdot (R_1)}{\cancel{\pi}(R_2)^2 \cdot 16 \cdot (R_2)} = \frac{1}{27}$

$\frac{(R_1)^3}{8 \cdot (R_2)^3} = \frac{1}{27}$

$\frac{(R_1)^3}{(R_2)^3} = \frac{8}{27}$

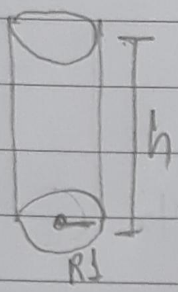
$\sqrt[3]{\frac{(R_1)^3}{(R_2)^3}} = \sqrt[3]{\frac{8}{27}}$

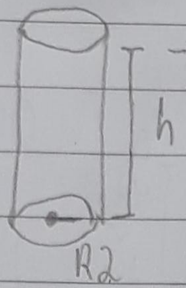
$\frac{\sqrt[3]{(R_1)^3}}{\sqrt[3]{(R_2)^3}} = \frac{\sqrt[3]{2^3}}{\sqrt[3]{3^3}}$

$\frac{(R_1)}{(R_2)} = \frac{2}{3}$

Alternativa (E)

3-

I


II


Aumento de 50%

100% + 50%

150%

$R_2 = 150\% \cdot R_1$

$R_2 = \frac{150 \div 5}{100 \div 5} \cdot R_1$

$R_2 = \frac{3}{2} \cdot R_1$

Volume $C_1 = \pi \cdot R_1^2 \cdot h$

$16\pi = \pi \cdot R_1^2 \cdot h$

$h = \frac{16\pi}{\pi \cdot R_1^2}$

* $h = \frac{16}{R_1^2}$

$AL C_2 = AT C_1$

$2\pi \cdot R_2 \cdot h = 2\pi \cdot R_1 \cdot h + 2\pi \cdot R_1^2$

$\cancel{2}\pi \cdot \frac{3}{\cancel{2}} \cdot R_1 \cdot h = 2\pi \cdot R_1 \cdot h + 2\pi \cdot R_1^2$

$3\pi \cdot R_1 \cdot h - 2\pi \cdot R_1 \cdot h = 2\pi \cdot R_1^2$

$1\pi \cdot R_1 \cdot h = 2\pi \cdot R_1^2$

$\pi \cdot \cancel{R_1} \cdot \frac{16}{\cancel{R_1}^2} = 2\pi \cdot R_1^2$

$\frac{16\pi}{R_1} = 2\pi \cdot R_1^2$

$R_1^3 = \frac{\cancel{16}^{\,8}\cancel{\pi}}{\cancel{2}\cancel{\pi}}$

$R_1 = \sqrt[3]{8}$

$R_1 = 2$

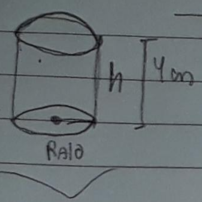
$h = \frac{16}{R_1^2}$

$h = \frac{16}{2^2}$

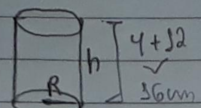
$h = \frac{16}{4}$

$h = 4$ Alternativa D

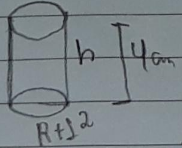
4-



→ podendo ser



OU



$V_1 = \pi \cdot R^2 \cdot 16$

$V_2 = \pi \cdot (R+12)^2 \cdot 4$

$\cancel{\pi} \cdot R^2 \cdot \cancel{16} = \cancel{\pi} \cdot (R+12)^2 \cdot 4$

$(R+12)^2 = 4 \cdot R^2$

$R^2 + 24R + 144 = 4R^2$

$-3R^2 + 24R + 144 = 0 \quad (\div -3)$

$R^2 - 8R - 48 = 0$

$\Delta = b^2 - 4 \cdot a \cdot c$

$\Delta = (-8)^2 - 4 \cdot 1 \cdot (-48)$

$\Delta = 64 + 192$

$\Delta = 256$

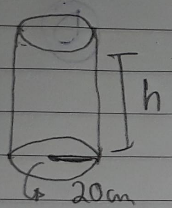
$X = \dfrac{-b \pm \sqrt{256}}{2 \cdot a}$

$X = \dfrac{8 \pm 16}{2}$

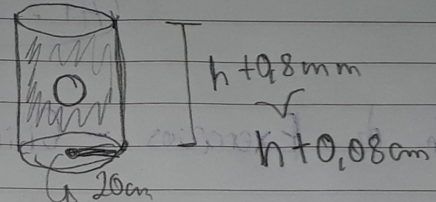
$X' = \dfrac{8+16}{2} = \dfrac{24}{2} = $ 12 cm Alternativa (A)

$X'' = \dfrac{8-16}{2} = \dfrac{-8}{2} = -4$ cm X não convém

5- Antes:



Depois:



$V_{pedra} = V_{depois} - V_{Antes}$

$V_p = \pi \cdot 20^2 \cdot (h + 0{,}08) - \pi \cdot 20^2 \cdot h$

$V_p = \pi \cdot 20^2 \, (\cancel{h} + 0{,}08 - \cancel{h})$

$V_p = \pi \cdot 4\cancel{00} \cdot \dfrac{8}{1\cancel{00}}$

$V_p = 32\pi$

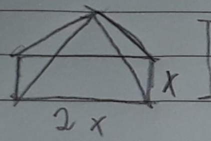
$V_p = 32 \cdot 3{,}14$

$V_p = 100{,}5 \text{ cm}^3$

Alternativa (B)

Lista de Exercícios - Pirâmides

1 -



$h = 8\,cm$

Volume $= \frac{Ab \cdot h}{3}$

$48 = \frac{(2x \cdot x) \cdot 8}{3}$

$\frac{\cancel{48}^{6} \cdot 3}{\cancel{8}} = 2x^2$

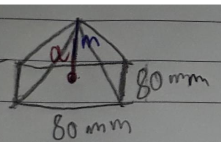
$18 = 2x^2$

$x^2 = \frac{18}{2}$

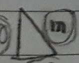
$X = \sqrt{9} \rightarrow \boxed{X = 3}$

Alternativa C

2 -



30 mm



$h = 30$

$a = \frac{80}{2} = 40$

$m^2 = 30^2 + 40^2$

$m^2 = 900 + 1600$

$m = \sqrt{2500}$

$m = 50\,mm$

$AT = 4 \cdot A_{\triangle}\, 50,\ 80 + A_{\square}\, 80,\ 80$

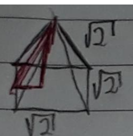
$AT = 4 \cdot \frac{\cancel{80}^{40} \cdot 50}{\cancel{2}} + 80 \cdot 80$

$AT = 8000 + 6400$

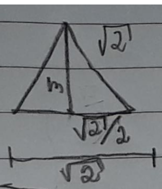
$AT = 14\,400\,mm^2$

Alternativa E

3 -



→ Face lateral



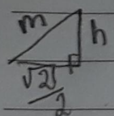
$(\sqrt{2})^2 = m^2 + \left(\frac{\sqrt{2}}{2}\right)^2$

$2 = m^2 + \frac{2}{4} \begin{smallmatrix}\div 2\\ \div 2\end{smallmatrix}$

$m^2 = 2 - \frac{1}{2}$

$m^2 = \frac{4-1}{2}$

$m^2 = \frac{3}{2}$



$m^2 = h^2 + \left(\frac{\sqrt{2}}{2}\right)^2$

$h^2 = \frac{3}{2} - \frac{2 \div 2}{4 \div 2}$

$h^2 = \frac{3}{2} - \frac{1}{2}$

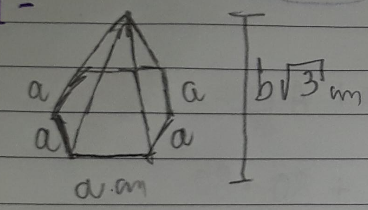
$h^2 = \frac{2}{2}$

$h = \sqrt{1}$

$h = 1\,cm$

Alternativa C

4-

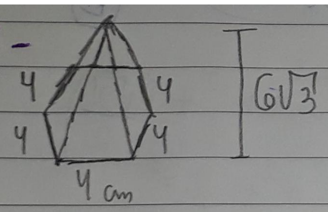


$$V = \frac{1}{\cancel{3}} \cdot \cancel{6}^{2} \cdot \frac{a^2\sqrt{3}}{4} \cdot b\sqrt{3}$$

$$V = \frac{2^{\div 2} \cdot a^2 \cdot b\,(\sqrt{3})^2}{4^{\div 2}}$$

Alternativa (A) ← $V = \dfrac{3a^2 \cdot b}{2}\ cm^3$

5-



$$V = \frac{1}{\cancel{3}} \cdot \cancel{6}^{2} \cdot \frac{\cancel{4} \cdot 4 \cdot \sqrt{3}}{\cancel{4}} \cdot 6\sqrt{3}$$

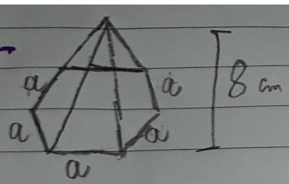
$$V = 2 \cdot 4 \cdot 6 \cdot (\sqrt{3})^2$$

$$V = 48 \cdot 3$$

$V = 144\ cm^3$

Alternativa (D)

6-



Perímetro ⬡ = 6 cm

$6a = 6$

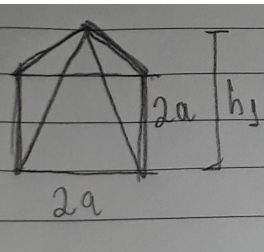
$a = \frac{6}{6} = 1\ cm$

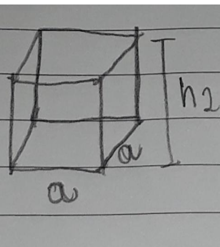
$$V = \frac{1}{\cancel{3}} \cdot \cancel{6}^{2} \cdot \frac{1^2\sqrt{3}}{\cancel{4}^{2}} \cdot 8^{2}$$

$V = 2 \cdot 2 \cdot \sqrt{3}$ → $V = 4\sqrt{3}\ cm^3$

Alternativa (A)

7-





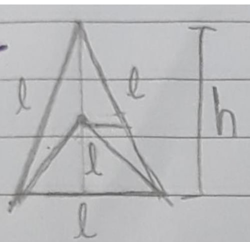
* $V_{pirâmide} = V_{prisma}$

$\frac{1}{3} \cdot 2a \cdot 2a \cdot h_1 = a \cdot a \cdot h_2$

$$\frac{h_1}{h_2} = \frac{\cancel{a^2} \cdot 3}{4\cancel{a^2}} = \frac{3}{4}$$

Alternativa (A)

8-



$$A_T = 6\sqrt{3}$$

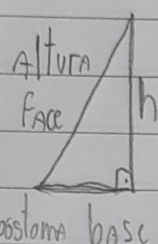
$$4 \cdot A_\Delta = 6\sqrt{3}$$

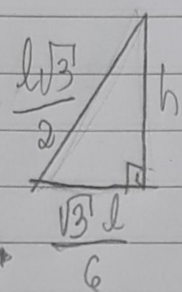
$$4 \cdot \frac{l^2\sqrt{3}}{4} = 6\sqrt{3}$$

$$l^2 = \frac{6\cancel{\sqrt{3}}}{\cancel{\sqrt{3}}}$$

$$l^2 = 6$$

Triângulo Equilátero

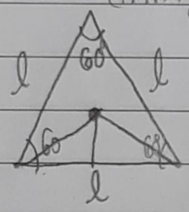


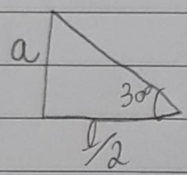


$$* \; h_\Delta = \frac{l\sqrt{3}}{2} \qquad * \; a_\Delta = \frac{\sqrt{3}\,l}{6}$$

(Triângulo equilátero)

Cálculo da Apótema =





$$\text{tg } 30° = a : l/2$$

$$\frac{\sqrt{3}}{3} = \frac{a \cdot 2}{l}$$

$$a = \frac{\sqrt{3}\,l}{6}$$

$$\left(\frac{l\sqrt{3}}{2}\right)^2 = h^2 + \left(\frac{\sqrt{3}\,l}{6}\right)^2$$

$$h^2 = \frac{3l}{4} - \frac{3l^2}{36}$$

$$h^2 = \frac{27l^2 - 3l^2}{36}$$

$$h^2 = \frac{24\,l^2}{36}$$

$$h^2 = \frac{24 \cdot 6}{36}$$

$$h = \sqrt{\frac{144}{36}}$$

$$h = \frac{\sqrt{144}}{\sqrt{36}}$$

$$h = \frac{12}{6}$$

Alternativa A

$$h = 2 \text{ cm}$$