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Disciplina: Matemática

IFSP - Câmpus Cubatão

Tarefa Básica 04

Cilindros e Pirâmides

(Fotos nas páginas seguintes)

1ª Lista – Cilindros

Exercícios 1 e 2:

Exercício 4 - Cilindros / Pirâmides

Exemplo Básico - Cilindros

1-)



$$\begin{aligned} R_1 &= 5 \text{ cm} \\ R_2 &= 10 \text{ cm} \\ h_1 &= 40 \text{ cm} \\ h &=? \end{aligned}$$

$$V_1 = V_2$$

$$V_1 = A_{\text{base}} \cdot h$$

$$V_1 = \pi \cdot R_1^2 \cdot h$$

$$V_1 = \pi \cdot 10^2 \cdot \frac{1}{3} \cdot 40$$

$$V_1 = \pi \cdot 100 \cdot \frac{1}{3} \cdot 40$$

$$V_1 = \pi \cdot 20 \cdot 40$$

$$V_1 = 800\pi \text{ cm}^3$$

$$V_2 = A_{\text{base}} \cdot h$$

$$V_2 = \pi \cdot R_2^2 \cdot h$$

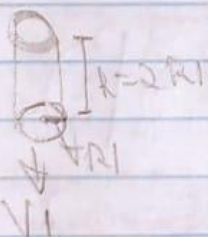
$$800\pi = \pi \cdot 5^2 \cdot h$$

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

$$800 = 25h$$

$$h = \frac{800}{25} \Rightarrow h = 32 \text{ cm}$$

2-)



$$\frac{V_1}{V_2} = \frac{1}{2} \Rightarrow \frac{\pi \cdot (R_1)^2 \cdot h_1}{\pi \cdot (R_2)^2 \cdot h_2} = \frac{1}{2} \Rightarrow \frac{(R_1)^2 \cdot 2R_1}{(R_2)^2 \cdot 16R_2} = \frac{1}{2} \Rightarrow \therefore$$

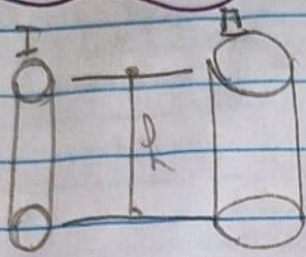
$$\therefore \frac{(R_1)^2 \cdot R_1 \cdot 2}{(R_2)^2 \cdot R_2 \cdot 16} = \frac{1}{2} \Rightarrow \frac{(R_1)^3 \cdot 1}{(R_2)^3 \cdot 8} = \frac{1}{2} \Rightarrow \frac{(R_1)^3}{(R_2)^3} = \frac{8}{2} = 4$$

$$\begin{pmatrix} R1 \\ R2 \end{pmatrix}^3 = \frac{8}{24} \Rightarrow \frac{R1}{R2} = \sqrt[3]{\frac{8}{24}} \Rightarrow \frac{R1}{R2} = \sqrt[3]{\frac{1}{3}} \Rightarrow \frac{R1}{R2} = \frac{1}{\sqrt[3]{3}}$$

$$\frac{R1}{R2} = \sqrt[3]{\frac{2^3}{3^3}} \Rightarrow \frac{R1}{R2} = \frac{2}{3} \rightarrow \text{Jotna E.}$$

Exercício 3:

3-1



$$V_A = 16\pi$$

$$C_2 \cdot A_{\text{lateral}} = C_1 \cdot A_{\text{total}}$$

$$h = ?$$

$$C_2 A_{\text{lateral}} = C_1 A_{\text{total}}$$

$$2\pi R \cdot h = 2\pi R(r+h)$$

$$2\pi \cancel{3} R h = 2\pi R(r+h)$$

$$3h = \frac{2\pi R(r+h)}{\cancel{2\pi}}$$

$$\cancel{R}$$

$$3h = 2(R+h)$$

$$3h = 2R + 2h$$

$$3h - 2h = 2R$$

$$h = 2R$$

$$h = 2R \Rightarrow h = 2 \cdot 2$$

$$\boxed{R = 4} \rightarrow \text{Situa D}$$

$$V_1 = 16\pi$$

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

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

$$r^2 \cdot h = 16$$

$$r^2 \cdot 2R = 16$$

$$r^2 \cdot R = \frac{16}{2}$$

$$r^3 = 8$$

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

$$R = \sqrt[3]{2^3} \Rightarrow R = 2$$

$$\begin{array}{r} 8/2 \\ 4/2 \\ 2/2 \end{array}$$

Exercícios 4 e 5:

$$4-) V = \pi \cdot R^2 \cdot h$$

Completar o raio da base e a altura.

$$R = (R+12)^2 \quad | \quad h = (4+12)$$

$$\pi \cdot R^2 \cdot h = \pi \cdot R^2 \cdot h$$

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

$$\pi (R^2 + 24R + 144) \cdot 4 = \pi \cdot R^2 \cdot 16$$

$$\cancel{\pi} (4R^2 + 96R + 576) = \cancel{\pi} R^2 \cdot 16$$

$$4R^2 + 96R + 576 = 16R^2$$

$$4R^2 - 16R^2 + 96R + 576 = 0$$

$$-12R^2 + 96R + 576 = 0 \quad (: -1)$$

$$12R^2 - 96R - 576 = 0 \quad (: 12)$$

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

$$A \quad B \quad C$$

$$\frac{-14 + 12}{-4} = 8$$

$$\frac{-4}{-4} \cdot 12 = -48$$

$$R^2$$

$$R''$$

→ Solução A.

$$\rightarrow \text{O raio } r = 12 \text{ cm}$$

→ Solução B.

5.)



$$R1 = 20 \text{ cm} \quad | \quad 0,8 \text{ mm} = 0,08 \text{ cm}$$

$$\pi = 3,14$$

$$V_P = V_d$$

$$V_P = 32\pi$$

$$V_P = 32 \cdot 3,14$$

$$V_P = 100,48 \text{ cm}^3$$

$$V_P \approx 100,5 \text{ cm}^3$$

→ Solução B.

$$V_d = \pi \cdot R^2 \cdot h$$

$$V_d = \pi \cdot (20)^2 \cdot 0,08$$

$$V_d = \pi \cdot 400 \cdot 0,08$$

$$V_d = 32\pi$$

2ª Lista – Pirâmides

Exercícios 1 e 2:

Exercício 1 – Pirâmide

$$1-) \begin{array}{l|l} a = x \text{ cm} & h = 8 \text{ cm} \\ b = 8 \text{ cm} & V = 48 \text{ cm}^3 \end{array}$$

$$V = \frac{1}{3} \cdot V_{\text{prisma}} \Rightarrow V = \frac{1}{3} \cdot A_{\text{base}} \cdot h \Rightarrow V = \frac{1}{3} \cdot ab \cdot h \therefore$$

$$\therefore 48 = \frac{1}{3} \cdot x \cdot 2x \cdot 8 \Rightarrow 48 \cdot 3 = 1 \cdot 2x^2 \cdot 8 \Rightarrow 144 = 2x^2 \cdot 8 \therefore$$

$$\therefore 144 = 16x^2 \Rightarrow \frac{144}{16} = x^2 \Rightarrow x^2 = 9 \Rightarrow x = \sqrt{9}$$

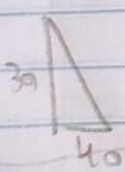
$$\text{Resposta C.}$$

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

$$2-1) \begin{array}{l|l|l} bl = 80 \text{ mm} & A_{\text{base}} = ? & a = 40 \text{ mm} \\ h = 30 \text{ mm} & & A = ? \end{array}$$

$$A_{\text{total}} = A_{\text{base}} + A_{\text{lateral}}$$

$$\text{Cálculo da Pirâmide} \quad A_{\text{base}} = l^2 \quad A_{\text{base}} = 80^2 \quad A_{\text{base}} = 6400 \text{ mm}^2$$



$$A^2 = h^2 + a^2$$

$$A^2 = 30^2 + 40^2$$

$$A^2 = 900 + 1600$$

$$A = \sqrt{2500}$$

$$\boxed{A = 50 \text{ mm}}$$

$$A_{\text{lateral}} = 4\Delta = \frac{1}{2} \cdot l \cdot A$$

$$A_{\text{lateral}} = \frac{1}{2} \cdot 80 \cdot 50 = 2 \cdot 80 \cdot 50$$

$$\boxed{A_{\text{lateral}} = 8000 \text{ mm}^2}$$

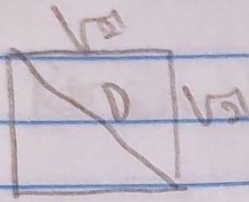
$$\Rightarrow A_{\text{total}} = A_{\text{base}} + A_{\text{lateral}}$$

$$A_{\text{total}} = 6400 + 8000$$

$$\boxed{A_{\text{total}} = 14.400} \quad \text{Resposta B.}$$

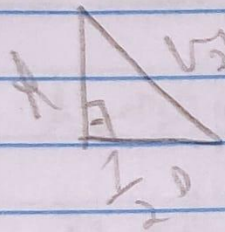
Exercício 3:

3-1)



$$D = 2\sqrt{2}$$

$$D = \sqrt{2} \cdot \sqrt{2} \Rightarrow D = 2$$



$$\Rightarrow (\sqrt{2})^2 = h^2 + 1^2$$

$$2 = h^2 + 1$$

$$h^2 = 1$$

$$h = \sqrt{1} \Rightarrow$$

$$h = 1 \text{ cm}$$

↳ letra c.

Exercícios 4 e 5:

4-) $\text{Aresta Base} = a \text{ cm} \mid V = ?$
 $h = 6\sqrt{3} \text{ cm}$

$$A_{\text{base}} = \frac{3a^2\sqrt{3}}{2} \Rightarrow A_{\text{base}} = \frac{3a^2\sqrt{3}}{2}$$

$V = \frac{1}{3} \cdot V_{\text{prisma}} \Rightarrow V = \frac{1}{3} \cdot A_{\text{base}} \cdot h \Rightarrow \therefore$

$$\therefore V = \frac{1}{3} \cdot \frac{3a^2\sqrt{3}}{2} \cdot 6\sqrt{3} \Rightarrow V = \frac{3a^2\sqrt{3}\sqrt{3} \cdot 6}{3 \cdot 2} \therefore$$

$$\therefore V = \frac{3a^2 \cdot 6}{2} \Rightarrow V = \frac{3a^2 \cdot 6}{2} \text{ cm}^3$$

\Rightarrow Letra A.

5-) $\text{Aresta Base} = \text{lado} = 4 \text{ cm} \mid h = 6\sqrt{3} \text{ cm} \mid V = ?$

$V = \frac{1}{3} \cdot V_{\text{prisma}}$

$V = \frac{1}{3} \cdot A_{\text{base}} \cdot h$

$V = \frac{1}{3} \cdot 24\sqrt{3} \cdot 6\sqrt{3}$

$V = \frac{24 \cdot 6 \cdot 3}{3}$

$V = \frac{24 \cdot 6 \cdot 3}{3}$

$A_{\text{base}} = \frac{3 \cdot 4^2 \sqrt{3}}{2}$

$A_{\text{base}} = \frac{3 \cdot 16 \sqrt{3}}{2}$

$A_{\text{base}} = \frac{3 \cdot 16 \sqrt{3}}{2}$

$A_{\text{base}} = 24\sqrt{3} \text{ cm}^2$

$V = 24 \cdot 6 \Rightarrow V = 144 \text{ cm}^3$

\Rightarrow Letra D.

Exercícios 6 e 7:

6-) Perímetro = 6 cm | $h = 8$ cm

$r = 8$

$2 \text{ hex} = \frac{6}{6} \Rightarrow 2 \text{ hex} = 1 \text{ cm}$

$A_{\text{hex}} = \frac{3l^2 \sqrt{3}}{2}$

$A_{\text{hex}} = \frac{3 \cdot 1^2 \sqrt{3}}{2}$

$A_{\text{hex}} = \frac{3\sqrt{3}}{2}$

$V = \frac{1}{3} \cdot V_{\text{prisma}}$

$V = \frac{1}{3} \cdot A_{\text{hex}} \cdot h$

$V = \frac{1}{3} \cdot \frac{3\sqrt{3}}{2} \cdot 8$

$V = \frac{1 \cdot 8 \cdot 3\sqrt{3}}{3 \cdot 2} \Rightarrow V = 4\sqrt{3} \text{ cm}^3$

\Rightarrow letra A.

7-)



$V_{\text{pir}} = V_{\text{prisma}}$



$V_{\text{prisma}} = A_{\text{base}} \cdot h_{\text{prisma}}$

$= l^2 \cdot h_{\text{prisma}}$

$V_{\text{prisma}} = a^2 \cdot h_{\text{prisma}}$

$V_{\text{pir}} = \frac{1}{3} \cdot V_{\text{prisma}}$

$V_{\text{pir}} = \frac{1}{3} \cdot A_{\text{base}} \cdot h_{\text{pir}}$

$V_{\text{pir}} = \frac{1}{3} \cdot l^2 \cdot h_{\text{pir}}$

$V_{\text{pir}} = \frac{1}{3} \cdot (2a)^2 \cdot h_{\text{pir}}$

$V_{\text{pir}} = \frac{4a^2 \cdot h_{\text{pir}}}{3}$

$V_{\text{pir}} = V_{\text{prisma}}$

$\frac{4a^2 \cdot h_{\text{pir}}}{3} = a^2 \cdot h_{\text{prisma}}$

$4a^2 \cdot h_{\text{pir}} = 3a^2 \cdot h_{\text{prisma}}$

$\frac{h_{\text{pir}}}{h_{\text{prisma}}} = \frac{3a^2}{4a^2} \Rightarrow$

$\frac{h_{\text{pir}}}{h_{\text{prisma}}} = \frac{3}{4}$

\Rightarrow letra A

Exercício 8:

8 → $G_{total} = l^2 \sqrt{3}$ | $A = ?$

$$6\sqrt{3} = l^2 \sqrt{3} \Rightarrow l^2 = 6 \Rightarrow \boxed{l = \sqrt{6}}$$
$$\frac{6\sqrt{3}}{\sqrt{3}} = l^2$$
$$h = \frac{l\sqrt{6}}{3} \Rightarrow h = \frac{\sqrt{6} \cdot \sqrt{6}}{3} \Rightarrow h = \frac{\sqrt{36}}{3} \Rightarrow h = \frac{6}{3} \therefore$$

$\therefore \boxed{h = 2 \text{ cm}}$
↳ altura A.