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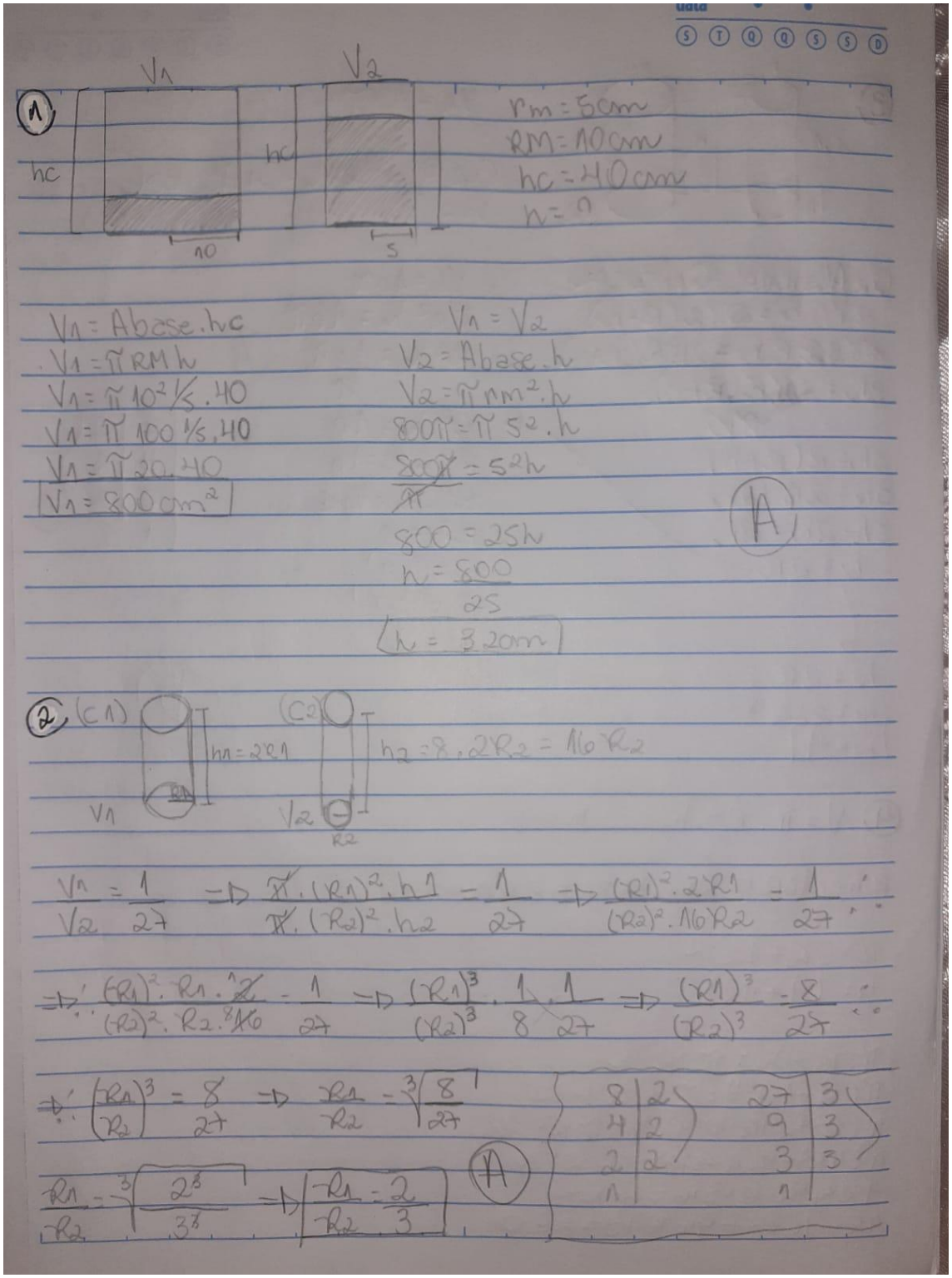
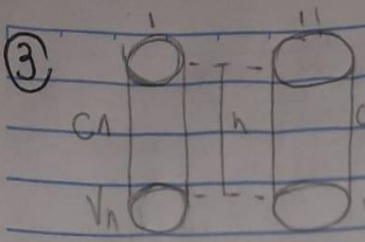
CTII348

Cilindros e Pirâmides

Cilindros



③



$V_1 = 16\pi$

C_2 Alateral $= C_1$ Atotal

$h = ?$

C_2 Alateral $= C_1$ Atotal

$2\pi R.h = 2\pi R(R+h)$

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

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

$3h = 2(R+h)$

$3h = 2R + 2h$

$3h - 2h = 2R$

$h = 2R$

$V_1 = 16\pi$

$\pi R^2.h = 16\pi$

$R^2.h = \frac{16\cancel{\pi}}{\cancel{\pi}}$

$R^2.h = 16$

$R^2.2R = 16$

$R^2.R = 16/2$

$R^3 = 8$

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

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

$R = 2$

8	2
4	2
2	2
1	

$h = 2R$

$h = 2.2$

$\boxed{h = 4}$

(D)

④ $V = \pi . R^2 . h$ $\quad h = 4$

AUMENTAR O RAIO DA BASE E A ALTURA

$R = (R + 12)^2$

$h = (4 + 12)$

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

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

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

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

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

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

data • •

S T Q Q S S D

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

$12R^2 - 96R - 576 = 0 \quad \div 12$

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

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

$\Delta = 64 + 192$

$\Delta = 256$

$R = \frac{8 \pm \sqrt{256}}{2.1} = \frac{8 \pm 16}{2}$

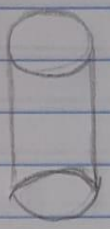
$R_1 = \frac{8+16}{2} = 24/2 = \boxed{12\,cm}$

$R_2 = 8-16/2 = -8/2 = -4$ (não convém)

(A)

O raio é 12cm

(5)



$R_1 = 20\,cm$

$0,8\,mm = 0,08\,cm$

$\pi = 3,14$

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

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

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

$V_d = 32\pi$

$V_p = V_d$

$V_p = 32\pi$

$V_p = 32 . 3,14$

$V_p = 100,48\,cm^3$

$(V_p \cong 100,5\,cm^3)$

(B)

Pirâmides

data • •

S T Q Q S S D

① a = x cm

b = 2x cm

h = 8 cm

Volume = 48 cm³

Volume = 1/3 . Volume prisma

Volume = 1/3 . Abase . h

Volume = 1/3 . a . b . h

48 = 1/3 . x . 2x . 8

48 . 3 = 1 . 2x² . 8

144 = 2x² . 8

144 = 16x²

144/16 = x²

x² = 9

x = √9

x = 3 cm

C

② 

h

b = 80 mm

h = 30 mm

Abase = ?

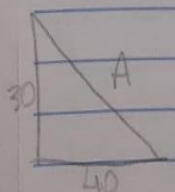
a = 40 mm

A = ?

Alateral =

Atotal = Abase + Alateral

Apotema da piramide



A² = h² + a²

A² = 30² + 40²

A² = 900 + 1600

A = √2500

A = 50 mm

data

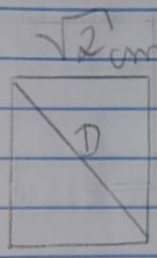
$A_{base} = \ell^2$
$A_{base} = 80^2$
$A_{base} = 6.400\ mm^2$

$A_{lateral}$ ≠ 4 faces ≠ 4 ℓ. A/2
$A_{lateral} = 4.80.50$
2
$A_{lateral} = 2.80.50$
$A_{lateral} = 8000\ mm^2$

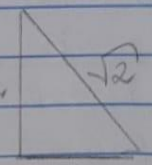
$A_{total} = A_{base} + A_{lateral}$
$A_{total} = 6400 + 8000$
$A_{total} = 14.400$

(E)

(3) $A_{resta\ lateral} = \sqrt{2}\ cm$
$A_{resta\ base} = \sqrt{2}\ cm$
$h_{piramide} = ?$



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



$(\sqrt{2})^2 = h^2 + (1/2\ D)^2$
$(\sqrt{2})^2 = h^2 + (1/2 \cdot 2)^2$
$(\sqrt{2})^2 = h^2 + 1^2$
$2 = h^2 + 1$
$h^2 = 2 - 1$
$h^2 = 1$
$h = \sqrt{1}$
$\boxed{h = 1\ cm}$

(C)

data • •

S T Q Q S S D

④ Aresta Base = Lado = 2 cm

$h = b\sqrt{3}$ cm

Volume = ?

$Volume = \frac{1}{3} \cdot Volume_{PRISMA}$

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

$Volume = \frac{1}{3} \cdot \frac{3a^2\sqrt{3}}{2} \cdot b\sqrt{3}$

$Volume = \frac{1 \cdot 3a^2\sqrt{3} \cdot \sqrt{3}b}{3 \cdot 2}$

$Volume = \frac{3a^2 \cancel{3} b}{\cancel{3} \cdot 2}$

$Volume = \frac{3a^2b}{2}$ cm³

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

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

(A)

⑤ Aresta Base = Lado = 4 cm

$h = 6\sqrt{3}$ cm

Volume = ?

$Volume = 1/3 \cdot Volume_{PRISMA}$

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

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

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

$Volume = \frac{24 \cdot 6 \cdot \cancel{3}}{\cancel{3}}$

$Volume = 24 \cdot 6$

$Volume = 144\ cm^3$

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

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

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

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

(D)

data • •

S T Q Q S S D

⑥ Perimetro = 6cm

h = 8cm

$\ell_{hexa} = 6/6$

$\ell_{hexA} = 1cm$

$A_{base} = \frac{3\ell^2\sqrt{3}}{2}$

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

$A_{base} = \frac{3 \cdot 1\sqrt{3}}{2}$

$A_{base} = \frac{3\sqrt{3}}{2}$

$Volume = 1/3\ Volume_{PRISMA}$

$Volume = 1/3 \cdot A_{base} \cdot h$

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

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

$Volume = 4\sqrt{3}\ cm^2$

(A)

⑦ $\ell_{ado\ Piramide} = 2a$

$Volume_{Piramide} = Volume_{PRISMA}$

$Volume_{Piramide} = 1/3 \cdot Volume_{Prisma}$

$Volume_{Piramide} = 1/3 \cdot A_{base} \cdot h_{piramide}$

$Volume_{Piramide} = 1/3 \cdot \ell^2 \cdot h_{piramide}$

$Volume_{Piramide} = 1/3 \cdot (2a)^2 \cdot h_{piramide}$

$Volume_{Piramide} = \frac{4a^2 \cdot h_{piramide}}{3}$

$Volume_{PRISMA} = A_{base} \cdot h_{prisma}$

$Volume_{PRISMA} = \ell^2 \cdot h_{prisma}$

$Volume_{PRISMA} = a^2 \cdot h_{prisma}$

$V_{olume\,Pirâmide} = V_{olume\,Prisma}$

$\frac{4a^2 \cdot h_{pirâmide}}{3} = a^2 \cdot h_{prisma}$ (A)

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

$\frac{h_{pirâmide}}{h_{prisma}} = \frac{3a^2}{4a^2} \Rightarrow \boxed{\frac{h_{pirâmide}}{h_{prisma}} = \frac{3}{4}}$

(8)

$A_{total} = 6\sqrt{3}\ cm^2$

$h = ?$

$6\sqrt{3} = a^2\sqrt{3}$

$a^2 = \frac{6\sqrt{3}}{\sqrt{3}}$

$a^2 = 6$

$a = \sqrt{6}$

ALTURA

$h = \frac{a\sqrt{6}}{3}$

$h = \frac{\sqrt{6} \cdot \sqrt{6}}{3}$

$h = \frac{6}{3}$

(A)

$\boxed{h = 2\ cm}$