INSTITUTO FEDERAL
São Paulo
Câmpus Cubatão

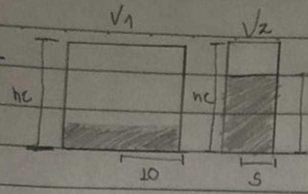
LETÍCIA DE ARAÚJO MACHADO
TURMA: CTII 317

CILÍNDROS E PIRÂMIDES

CUBATÃO
2021

S T Q Q S S D __/__/__

1-



$rm = 5\ cm$

$RM = 10\ cm$

$hc = 40\ cm$

$h = ?$

$V1 = Abase . hc$

$V1 = \pi\ RM\ h$

$V1 = \pi\ 10^2\ 1/5 . 40$

$V1 = \pi\ 100\ 1/5 . 40$

$V1 = \pi\ 20 . 40$

$V1 = 800\ cm^2$

$V1 = V2$

$V2 = Abase . h$

$V2 = \pi . rm^2 . h$

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

$\frac{800\cancel{\pi}}{\cancel{\pi}} = 5^2 . h$

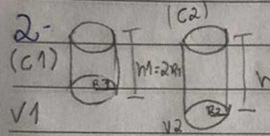
$800 = 25h$

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

$\boxed{h = 320 m}$

$\boxed{A}$

2-



$h2 = 8 . 2R2 = 16 R2$

$$\frac{V1}{V2} = \frac{1}{27} \Rightarrow \frac{\pi . (R1)^2 . h1}{\pi . (R2)^2 . h2} = \frac{1}{27} \Rightarrow \frac{(R1)^2 . 2R1}{(R2)^2 . 16R2} = \frac{1}{27} \therefore$$

$$\therefore \frac{(R1)^2 . R1 . \cancel{2}^{1}}{(R2)^2 . R2 . \cancel{16}^{8}} . \frac{1}{27} \Rightarrow \frac{(R1)^3}{(R2)^3} . \frac{1}{8} . \frac{1}{27} \Rightarrow \frac{(R1)^3}{(R2)^3} . \frac{8}{27} \therefore$$

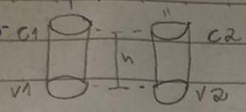
$$\therefore \left(\frac{R1}{R2}\right)^3 = \frac{8}{27} \Rightarrow \frac{R1}{R2} = \sqrt[3]{\frac{8}{27}}$$

$$\frac{R1}{R2} = \sqrt[3]{\frac{2^{\cancel{3}}}{3^{\cancel{3}}}} = \boxed{\frac{R1}{R2} = \frac{2}{3}}$$

A

8	2	27	3
4	2	9	3
2	2	3	3
1		1	

__/__/__

3- 

$V_1 = 16\pi$

C_2 Alateral $= C_1$ Atotal

$h = ?$

C_2 Alateral $= C_1$total

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

$2\pi\, 3/\cancel{2}R.h = 2\pi R(R+h)$

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

$3h = 2(R+h)$

$3h = 2R + 2h$

$3h - 2h = 2R$

$h = 2R$

$V_1 = 16\pi$

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

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

$R^2.h = 16$

$R^2.2R = 16$

$R^2.R = 16/2$

$R^3 = 8$

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

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

$R = 2$

8	2
4	2
2	2
1	

$h = 2R$

$h = 2.2$

$\boxed{h = 4}$

1)

4-

$V = \pi.R^2.h \quad = h = 4$

aumentar o raio da base e a altura

$R = (R+12)^2$

$h = (4+12)$

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

$\pi(R+12)^2.4 = \pi.R^2(4+12)$

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

$\cancel{\pi}(4R^2+96R+576) = \cancel{\pi}.R^2.16$

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

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

spiral

S T Q Q S S D   __/__/__

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

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

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

$\Delta=(-8)^2.4.1.(-48)$

$\Delta=64+192$

$\Delta=256$

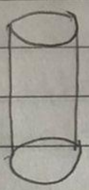
$R=\dfrac{8\pm\sqrt{256}}{2.1}=\dfrac{8\pm16}{2}$

$R=\dfrac{8+16}{2}=\dfrac{24}{2}=12$

$R'=\dfrac{8-16}{2}=\dfrac{-8}{2}=\cancel{-4}$

$\boxed{A}$ $\boxed{\text{O raio é 12cm}}$

5-



R1 = 20 cm

0,8 mm = 0,08 cm

$\pi = 3{,}14$

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

$Vd=\pi.(20)^2.0{,}08$

$Vd=\pi.400.0{,}08$

$Vd=32.\pi$

$Vp=Vd$

$Vp=32\pi$

$Vp=32.3{,}14$

$Vp=100{,}48\ cm^3$

$\boxed{Vp\cong 100{,}5\ cm^3}$

$\boxed{B}$

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1- a = x cm

b = 2x cm

h = 8 cm

V = 48 cm^3

$\boxed{C}$

$V = \frac{1}{3}$. Volume prisma

V = 1/3 . Abase . h

V = 1/3 . a . b . h

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

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

144 = 2 . x^2 . 8

144 = 16x^2

144/16 = x^2

x^2 = 9

x = $\sqrt{9}$

x = 3cm

2- bl = 80mm

h = 30mm

Abase = ?

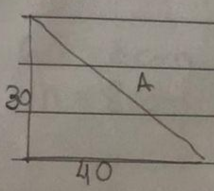
a = 40mm

A = ?

A lateral = ?

Atotal = Abase + Alateral

Apotema da piramide



A^2 = h^2 + a^2

A^2 = 30^2 + 40^2

A^2 = 900 + 1600

A = $\sqrt{25000}$

A = 50mm

Abase = l^2

Abase = 80^2

Abase = 6400 mm^2

Alateral ⇒ 4 triang ⇒ 4 l A/2

Alateral = $\frac{\cancel{4}^{2} . 80 . 50}{\cancel{2}}$

A lateral = 2 . 80 . 50

A lateral = 8000 mm^2

Atotal = Abase + Alateral

Atotal = 6400 + 8000

Atotal = 14400.

$\boxed{E}$

spiral

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3 $l^2 = h^2 + (r^2/2)$

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

$2 = h^2 + 2/2$

$2 = h^2 + 1$

$2 - 1 = h^2$

$h^2 = 1$

$h = \sqrt{1}$

$\boxed{h = 1}$

$\boxed{C}$

4 - Aresta Base = lado = a cm

$h = b\sqrt{3}$ cm

$V = ?$

$V = 1/3 .$ Volume prisma

$V = 1/3 .$ Abase.h

$V = \frac{1}{3} . \frac{3a^2\sqrt{3}}{2} . b\sqrt{3}$

$V = \frac{1 . 3a^2\sqrt{3}.\sqrt{3}b}{3.2}$

$V = \frac{3a^2 \cancel{3}b}{\cancel{3}.2}$

$\boxed{V = \frac{3a^2 b}{2} \text{ cm}^3}$

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

$\boxed{\text{Abase} = \frac{3a^2\sqrt{3}}{2}}$

$\boxed{A}$

S T Q Q S S D

5- Aresta Base $= l = 4\,cm$

$h = 6\sqrt{3}\,cm$

$V = ?$

$V = 1/3 \cdot$ Volume prisma

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

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

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

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

$V = 24 \cdot 6$

$\boxed{V = 144\,cm^3}$

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

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

$A_{base} = \frac{3 \cdot \cancel{16}^{8}\sqrt{3}}{\cancel{2}}$

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

$\boxed{D}$

6- $P = 6\,cm$

$h = 8\,cm$

$l_{hexa} = 6/6$

$l_{hexa} = 1\,cm$

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

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

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

$V = 1/3 \cdot$ Volume prisma

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

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

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

$\boxed{V = 4\sqrt{3}\,cm^2}$

$\boxed{A}$

__/__/__ S T Q Q S S D

7- lado piramide = LP = 2a
volume piramide = volume prisma =

volume piramide = 1/3 . volume prisma
volume piramide = 1/3 . Abase . hpiramide
volume piramide = 1/3 . l^2 . h piramide
volume piramide = 1/3 . $(2a)^2$. h piramide
volume piramide = $\frac{4a^2 \text{. h piramide}}{3}$

V prisma = Abase . h prisma
V prisma = l^2 . h prisma
V prisma = a^2 . h prisma

8-

A = [(b+h)/2] * 4

a altura de um triangulo regular é igual a aresta vezes $\sqrt{3}/2$ -> h = a $\sqrt{3}/2$

$a^2 = b^2 + c^2$
hipotenusa a^2 = base/2^2 + altura^2
$a^2 = (a/2)^2 + h^2$
$a^2 - a^2/4 = h^2$
$(4a^2 - a^2)/4 = h^2$
$\sqrt{(3a^2/4)} = h$
$a\sqrt{3/2} = h$

$A = [(b \times h)/2] \times 4$
$A = [(a \times a\sqrt{3}/2)/2] \times 4$
$A = (a^2\sqrt{3}/4) \times 4$
$A = a^2\sqrt{3}$

-> $6\sqrt{3}$ cm = $a^2\sqrt{3}$
$a^2 = 6\sqrt{3}/\sqrt{3}$
$a = \sqrt{6}$

altura de um tetraedro regular vale: $H = a\sqrt{6}/3$

$H = a\sqrt{6}/3$
$H = \frac{\sqrt{6} \times \sqrt{6}}{3}$
$H = \frac{6}{3}$
$\boxed{H = 2}$

spiral