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CTII348

Prismas e Paralelepípedo Reto Retângulo

Prismas

① $A_{total} = 80\,m^2$

$h = 3m$

$2A_{base} = 2x$

$A_{lateral} = 4.3x = 12x$

$A_{total} = 2A_{base} + A_{lateral}$

$80 = 2x^2 + 12x$

$2x^2 + 12x - 80 = 0$

$\Delta = 12^2 - 4.2(-80)$

$\Delta = 144 + 640$

$\Delta = 784$

$x = \frac{-12 \pm \sqrt{784}}{2.2}$

$x = \frac{-12 \pm 28}{4}$

$x_1 = \frac{-12+28}{4} = \frac{16}{4} = 4m$

$x_2 = \frac{-12-28}{4} = \frac{-40}{4} = -10$ (não convém)

O LADO DA MEDE 4m

② $A_{base} = 24\sqrt{3}\,cm^2$

$h = 2\sqrt{3}$

base → $24\sqrt{3} = \frac{3\ell^2\sqrt{3}}{2}$

$48\sqrt{3} = 3\ell^2\sqrt{3}$

$\frac{48\sqrt{3}}{3} = \ell^2\sqrt{3}$

$16\sqrt{3} = \ell^2\sqrt{3}$

$\ell^2 = \frac{16\cancel{\sqrt{3}}}{\cancel{\sqrt{3}}}$

$\ell^2 = 16$

$\ell = \sqrt{16} \longrightarrow \ell = 4$

$A_{lateral} = 6$ retangulos $. L . h$

$A_{lateral} = 6 . 4 . 2\sqrt{3}$

$\boxed{A_{lateral} = 48\sqrt{3}\ cm^2}$

3) $h = \sqrt{3}$

$R = 2 = l$

$l = 2$

$A_{base} = \frac{3l^2\sqrt{3}}{2} \Rightarrow \frac{3 . 2^2\sqrt{3}}{2} \Rightarrow \frac{3 . 4\sqrt{3}}{2} \Rightarrow \frac{12\sqrt{3}}{2}$

$A_{base} = 6\sqrt{3}$

$A_{lateral} = 6 . 2\sqrt{3} \Rightarrow A_{lateral} = 12\sqrt{3}$

$A_{total} = 2 . A_{base} + A_{lateral}$

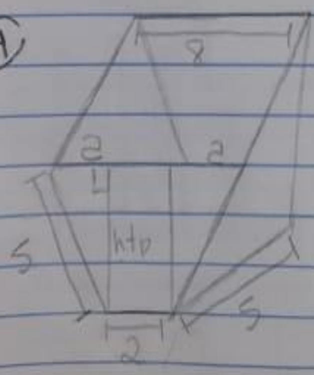
$A_{total} = 2 . 6\sqrt{3} + 12\sqrt{3}$

$A_{total} = 12\sqrt{3} + 12\sqrt{3}$

$\boxed{A_{total} = 24\sqrt{3}}$

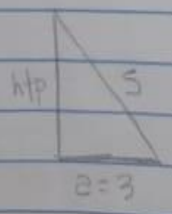
B

4)



$B = 8m$; $h_{prisma} = 5m$

$b = 2m$; $h_{tp} = ?$



$5^2 = 3^2 + htp^2$

$25 = 9 + htp^2$

$25 - 9 = htp^2$

$htp^2 = 16$

$htp = \sqrt{16}$

$htp = 4$

$a + 2 + a = 8$

$2a = 8 - 2$

$2a = 6$

$a = 6/2$

$a = 3$

$A_{base} = \frac{(B+b) . htp}{2} \Rightarrow \frac{(8+2) . \cancel{4}^2}{\cancel{2}} \Rightarrow 10 . 2$

$A_{base} = 20m$

data . .

S T Q Q S S D

$Volume = A_{base} . h_{PRISMA}$

$Volume = 20.5$

$Volume = 100 m^2$

D

(5) $b + R_q = 15$

$h + R_q = 10$

$h_{PRISMA} = 10$

$A_{base} = \frac{15.10}{2} = \frac{150}{2} \Rightarrow A_{base} = 75 m^3$

$Volume = A_{base} . h_{PRISMA}$

$Volume = 75.10$

$|Volume = 750 m^3|$

C

(6) Dimensões da base são x e y

Altura igual à z

Área total igual à $4x^2$

$z = 2y$

$A_{total} = 2.a.b + 2.a.c + 2bc$

$4x^2 = 2xy + 2xz + 2yz$

$\cancel{4}^{2}x^2 = \cancel{2}(xy + xz + yz)$

$2x^2 = xy + xz + yz$

$2x^2 = xy + x2y + y.2y$

$2x^2 = 3xy + 2y^2$

$2y^2 + 3xy - 2x^2$

$\Delta = (3x)^2 - 4.2.(-2x^2)$

$\Delta = 9x^2 + 16x^2$

$\Delta = 25x^2$

$y = \frac{-3x \pm \sqrt{25x^2}}{2.2}$

$y = \frac{-3x \pm 5x}{4}$

$y_1 = \frac{-3x-5x}{4} = \frac{\cancel{2}x}{\cancel{4}} = \frac{x}{2}$

$y_2 = \frac{-3x-5x}{4} = \frac{-8x}{4} = -2x \rightarrow$ ñ convem

$z = 2\frac{x}{2}$

$z = x$

Volume $= x \cdot y \cdot z$

Volume $= x \cdot \frac{x}{2} \cdot x$

$\boxed{\text{Volume} = \frac{x^3}{2}}$

C

Paralelepípedo Reto Retângulo

data

S T Q Q S S D

1) Comprimento = 51 cm
LARGURA = 26 cm
ALTURA = 12,5 cm
ESPESSURA = 0,5 cm

Comp Int = 51 - (2.0,5)
Comp Int = 51 - 1
Comp Int = 50 cm

Larg Int = 26 - (2.0,5)
Larg Int = 26 - 1
Larg Int = 25 cm

V Int = Comp Int . Larg Int . Alt Int
V Int = 50.25.12
V Int = 15000 cm^3

Alt Int = 12,5 - 0,5
Alt Int = 12 cm

cm^3 — m^3

$$\frac{15000}{1000000} = \boxed{V_{m^3} = 0{,}015\ m^3}$$

A

2) A total = 72 m^2

$72 = 6a^2$
$72/6 = a^2$
$a^2 = 12$
$a = \sqrt{12}$
$a = \sqrt{2^2 \cdot 3}$
$a = 2\sqrt{3}$

12	2
6	2
3	3
1	

DIAGONAL = $a\sqrt{3}$
DIAGONAL = $2.\sqrt{3}.\sqrt{3}$
DIAGONAL = 2.3
DIAGONAL = 6

B

data . .

S T Q Q S S D

(3) $a = 50\,cm \xrightarrow{\div 100} a = 0{,}5$

$Volume = a^3$
$Volume = 0{,}5^3$
$Volume = 0{,}125\,m^3$

Volume em Litros

A

$VL = 0{,}125 \cdot 1000$
$VL = 125\,L$

(4) $a = 1\,m$

$Volume = a^3$
$Volume = 1\,m^3$

Volume em Litros
$VL = 1 \cdot 1000$
$VL = 1000\,L$

Se retirar 1L
$VL_R = 1000 - 1$
$VL_R = 999\,L$

$1\,m$ ——— $1000\,L$
$(1\,m - x)$ ——— $999\,L$

$999\,L \cdot 1\,m = 1000\,L\,(1\,m - x)$
$999 = 1000 - 1000x$
$-1000x = 999 - 1000$
$-1000x = -1 \quad \times(-1)$
$1000x = 1$
$x = \frac{1}{1000}$

$\boxed{x = 0{,}001\,m}$

data / /
S T Q Q S S D

(5) Se supormos que o paralelepípedo tem medidas igual à 2cm, 4cm, 5 cm
Então

$V = 2.4.5$
$V = 40\ cm^2$

$V = 2(4.2)(5.2)$
$V = 2.8.10$
$V = 160\ cm^3$

Por isso:

$\frac{160 cm^3}{40 cm^3} = 4 \longrightarrow \boxed{4V}$

C

(6) $l = 4\sqrt{3}$
$a = 4\sqrt{3}$
Volume P = Vcubo
$h = ?$

Volume P = Vcubo
$A_{base} . h = a^3$
$\frac{l^2 \sqrt{3}}{4} = a^3$
$\frac{(4\sqrt{3})^2 \sqrt{3} . h}{4} = (4\sqrt{3})^3$
$\frac{(4\cancel{\sqrt{3}})^2 \cancel{\sqrt{3}} . h}{4} = \cancel{4\sqrt{3}} . \cancel{4\sqrt{3}} . \cancel{4\sqrt{3}}$
$\frac{h}{4} = 4$
$h = 4.4$
$h = 16$

data . .

S T Q Q S S D

$A_{lateral} = 3 \cdot 4\sqrt{3} \cdot 16$

$A_{lateral} = 192\sqrt{3}$

$A_{base} = \dfrac{(4\sqrt{3})^2 \cdot \sqrt{3}}{4}$

$A_{base} = \dfrac{\cancel{16} \cdot 3 \cdot \sqrt{3}}{\cancel{4}}$

$A_{base} = 4 \cdot 3\sqrt{3}$

$A_{base} = 12\sqrt{3}$

$A_{total} = 2 \cdot A_{base} + A_{lateral}$

$A_{total} = 2 \cdot 12 \cdot \sqrt{3} + 192\sqrt{3}$

$A_{total} = 24\sqrt{3} + 192\sqrt{3}$

$\boxed{A_{total} = 216\sqrt{3}\ cm^2}$

D