

Giovanna Santana Pennisi - CTII 350

Lista de Exercícios - Aula 30

Lista de Exercícios - Prismas

1 - $A_T = 80 \text{ m}^2$ / $\text{Altura} = 3 \text{ m}$ / $\text{lado} = ?$

$A_T = 2AB + A_L$
 $80 = 2l^2 + (4 \cdot 3 \cdot l)$
 $2l^2 + 12l - 80 = 0$

$\Delta = b^2 - 4 \cdot a \cdot c$
 $\Delta = 12^2 - 4 \cdot 2 \cdot (-80)$
 $\Delta = 784$

$l = \frac{-b \pm \sqrt{\Delta}}{2 \cdot a} = \frac{-12 \pm 28}{4}$
 $l_1 = \frac{-12 + 28}{4} = \frac{16}{4} = \boxed{l = 4 \text{ m}}$
 $l_2 = \frac{-12 - 28}{4} = \frac{-40}{4} = \boxed{-10 \text{ m}}$ não convém

2 - $AB = 24\sqrt{3} \text{ cm}^2$ / $\text{Altura} = 2\sqrt{3} \text{ cm}$ / $A_L = ?$

Prisma hexagonal regular:

$AB = \frac{6l^2\sqrt{3}}{4}$
 $24\sqrt{3} = \frac{6l^2\sqrt{3}}{4}$
 $96 = 6l^2$
 $l^2 = \frac{96}{6} = 16$
 $l = \sqrt{16} = \boxed{l = 4 \text{ cm}}$

$A_L = 6 \cdot 4 \cdot 2\sqrt{3}$
 $A_L = 24 \cdot 2\sqrt{3}$
 $\boxed{A_L = 48\sqrt{3} \text{ cm}^2}$

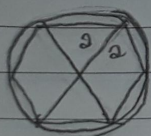
3 - $\text{Altura} = \sqrt{3}$
 $r = 2 = l$
 $A_T = ?$

Prisma reto hexagonal regular

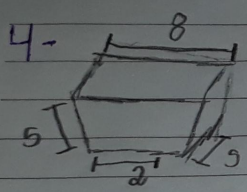
$AB = \frac{6 \cdot 2^2 \sqrt{3}}{4}$
 $AB = 6\sqrt{3}$
 $A_L = 6 \cdot 2 \cdot \sqrt{3}$
 $A_L = 12\sqrt{3}$

$A_T = 2AB + A_L$
 $A_T = 2 \cdot 6\sqrt{3} + 12\sqrt{3}$
 $A_T = 12\sqrt{3} + 12\sqrt{3}$
 $\boxed{A_T = 24\sqrt{3}}$

Alternativa B



4-



$B = 80$
 $b = 2$
 $v = ?$

$A_B = \frac{(2+8) \cdot 4}{2}$
 $A_B = 10 \cdot \frac{4}{2}$
 $A_B = 20$

$V = A_B \cdot S$
 $V = 20 \cdot 5$
 $V = 100 \text{ m}^3$

Alternativa (D)

$5^2 = 3^2 + h^2$
 $25 = 9 + h^2$
 $h^2 = 25 - 9$
 $h = \sqrt{16}$
 $h = 4$

5- $V = A_B \cdot h$
 $V = A_B \cdot 10$
 $V = 15 \cdot 10^5 \cdot 10$

$V = 150 \cdot 5$
 $V = 750 \text{ cm}^3$

Alternativa (C)

6- $\text{Altura} = z = 2y$; $A_T = 4x^2$ / Prisma quadrangular reto: $A_B = x \cdot y$

$A_L = 2 \cdot (x \cdot 2y) + 2 \cdot (y \cdot 2y)$
 $A_L = 4xy + 4y^2$

$A_T = 2 \cdot A_B + A_L$
 $4x^2 = 2xy + (4xy + 4y^2)$
 $4x^2 = 6xy + 4y^2$
 $4x^2 - 6xy - 4y^2 = 0$

$\Delta = (-6y)^2 - 4 \cdot 4 \cdot (-4y^2)$
 $\Delta = 36y^2 + 64y^2$
 $\Delta = 100y^2$

$x = \frac{-(-6y) \pm \sqrt{100y^2}}{2 \cdot 4}$
 $x = \frac{6y \pm 10y}{8}$

$x_1 = \frac{6y + 10y}{8} = \frac{16y}{8} \rightarrow 2y$
 $x_{II} = \frac{6y - 10y}{8} = \frac{-4y}{8}$ Não
 Convém

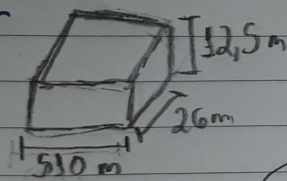
$x = 2y$
 $y = \frac{x}{2}$

$A_B = x \cdot \frac{x}{2}$
 $A_B = \frac{x^2}{2}$

$v = \frac{x^2}{2} \cdot x = \frac{x^3}{2}$

Alternativa (C)

Lista de Exercícios - Paralelepípedos e Cubos

1-  $\left\{ \begin{array}{l} \text{Espessura} = 0,5 \text{ m} \\ \text{Comprimento} = 53 - (2 \cdot 0,5) = 53 - 1 = 50 \text{ m} \\ \text{Largura} = 26 - (2 \cdot 0,5) = 26 - 1 = 25 \text{ m} \\ \text{Altura} = 12,5 - 0,5 = 12 \text{ m} \end{array} \right.$

$\rightarrow 50 \times 25 \times 12 \text{ m}$

$V = 50 \cdot 25 \cdot 12$

$V = 15000 \text{ cm}^3 \rightarrow V = 0,015 \text{ m}^3$ Alternativa (A)

2- $AT = 72 \text{ m}^2$ $\left\{ \begin{array}{l} 72 = 6a^2 \\ a^2 = \frac{72}{6} \\ a = \sqrt{12} \rightarrow a = 2\sqrt{3} \text{ m} \end{array} \right.$ $\left\{ \begin{array}{l} D = \sqrt{3} \cdot a^2 \\ D = \sqrt{3} \cdot (2\sqrt{3})^2 \\ D = \sqrt{3} \cdot 12 \\ D = \sqrt{36} \rightarrow D = 6 \text{ m} \end{array} \right.$ Alternativa (B)

3- $a = 50 \text{ cm} \rightarrow \frac{50}{100} = 0,5 \text{ m}$ $\left\{ \begin{array}{l} V = a^3 \\ V = 0,5^3 \\ V = 0,125 \text{ m}^3 \end{array} \right.$ $\rightarrow V = 0,125 \cdot 1000$

$V = ?$ $\rightarrow V = 125 \text{ litros}$ Alternativa (A)

4- $\text{Aresta} = 1 \text{ m}$

$V = a^3$

$V = 1^3$

$V = 1 \text{ m}^3$

$\rightarrow 1 \cdot 1000$

$\rightarrow 1000 \text{ litros}$

$\rightarrow 1000 - 1$

$\rightarrow 999 \text{ litros}$

$\left\{ \begin{array}{l} 1 \text{ m}^3 \rightarrow 1000 \text{ l} \\ 1 \text{ m}^3 - x \rightarrow 999 \text{ l} \end{array} \right.$

$\left\{ \begin{array}{l} 1000 - 1000x = 999 \\ -1000x = 999 - 1000 \\ (-1) \cdot -1000x = -1 \cdot (-1) \\ 1000x = 1 \end{array} \right.$

$x = \frac{1}{1000} \rightarrow 0,001 \text{ m}^3$

$$5 - V = a \cdot b \cdot c$$

$$V_1 = 2a \cdot 2b \cdot c \rightarrow V_1 = 4abc$$

Alternativa

\rightarrow Como $V_1 = 4abc$ e $V = abc$, temos que

$$V_1 = 4V$$

©

$$6 - l_{\text{lado}} = 4\sqrt{3} \text{ cm} - \text{equilátero}$$

$$A_T = ?$$

$$h = ?$$

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

$$V = 64 \cdot 3 \cdot \sqrt{3}$$

$$V = 192\sqrt{3} \text{ cm}^3$$

$$h_{\Delta} = \frac{4\sqrt{3} \cdot \sqrt{3}}{2}$$

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

$$h_{\square} = \frac{192\sqrt{3}}{12\sqrt{3}}$$

$$h_{\Delta} = 6 \text{ cm}$$

$$A_B = 12\sqrt{3} \text{ cm}^2$$

$$h_{\square} = 16 \text{ cm}$$

$$A_L = 3 \cdot 4\sqrt{3} \cdot 16$$

\checkmark

$$A_L = 192\sqrt{3} \text{ cm}^2$$

$$A_T = 2A_B + A_L$$

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

$$A_T = 24\sqrt{3} + 192\sqrt{3}$$

$$A_T = 216\sqrt{3} \text{ cm}^2$$

Alternativa

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