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**Turma:** CTII 348

**Prontuário:** CB1990209

**Disciplina:** Matemática

IFSP - Câmpus Cubatão

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Tarefa Básica 05

Cones e Troncos

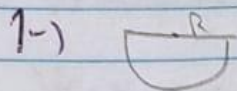
(Fotos nas páginas seguintes)

# 1ª Lista – Cones

## Exercícios 1 e 2:

### matéria 5 - cones e troncos

### Sarela Básica - cones



$$R = 20 \text{ cm} \quad | \quad R = g \quad | \quad g = 20 \text{ cm}$$



$A_{\text{semi}} = A_{\text{lateral}}$   
 $\text{cone}$

$$\frac{1}{2} \cdot \pi \cdot R^2 = \pi \cdot R \cdot g$$

$$\frac{1}{2} \cdot \pi \cdot 20^2 = \pi \cdot R \cdot 20$$

$$\pi \cdot 20^2 = \pi \cdot R \cdot 40$$

$$R \cdot 400 = R \cdot 40$$

$$R = \frac{400}{40} \Rightarrow R = 10$$



$$g^2 = R^2 + r^2$$

$$20^2 = R^2 + 10^2$$

$$400 = R^2 + 100$$

$$400 - 100 = R^2$$

$$R^2 = 300$$

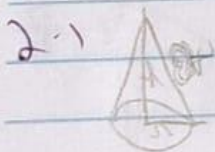
$$R = \sqrt{300}$$

$$R = \sqrt{2^2 \cdot 3 \cdot 5^2}$$

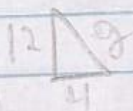
$$R = 2 \cdot 5 \sqrt{3}$$

$$R = 10\sqrt{3} \text{ cm} \rightarrow \text{alternativa A.}$$

$$\begin{array}{r|l} 300 & 2 \\ \hline 150 & 2 \\ \hline 75 & 3 \\ \hline 25 & 5 \\ \hline 5 & 5 \\ \hline 1 & \end{array}$$



$$R = 12 \text{ cm} \quad | \quad V = 64\pi \text{ cm}^3 \quad | \quad g = ?$$



$$V = \frac{1}{3} \cdot \pi \cdot R^2 \cdot g$$

$$64\pi = \frac{1}{3} \cdot \pi \cdot R^2 \cdot 12$$

$$64 \cdot 3 = R^2 \cdot 12$$

$$192 = R^2 \cdot 12$$

$$R^2 = \frac{192}{12}$$

$$R^2 = 16$$

$$R = \sqrt{16}$$

$$R = 4$$

$$g^2 = R^2 + r^2$$

$$g^2 = 12^2 + 4^2$$

$$g^2 = 160$$

$$g = \sqrt{160}$$

$$g = \sqrt{2^2 \cdot 2^2 \cdot 2 \cdot 5}$$

$$g = 2 \cdot 2 \sqrt{2 \cdot 5}$$

$$g = 4\sqrt{10}$$

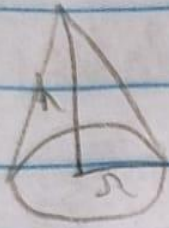
$$g = 4\sqrt{10} \text{ cm} \rightarrow \text{alternativa B.}$$

$$\begin{array}{r|l} 160 & 2 \\ \hline 80 & 2 \\ \hline 40 & 2 \\ \hline 20 & 2 \\ \hline 10 & 2 \\ \hline 5 & 5 \\ \hline 1 & \end{array}$$



# Exercícios 3 e 4:

3-1



$$A = \text{área lateral} = 36\pi \text{ cm}^2$$

$$36\pi = \pi r^2$$

$$r^2 = 36$$

$$r = \sqrt{36}$$

$$\boxed{r=6}$$

$$\boxed{R=6}$$

$$V = \frac{1}{3} \cdot \pi \cdot r^2 \cdot h$$

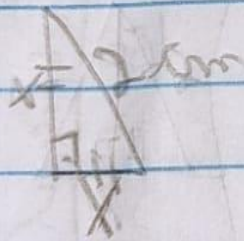
$$V = \frac{1}{3} \cdot \pi \cdot 6^2 \cdot 8$$

$$V = \pi \cdot 36 \cdot 2$$

$$\boxed{V = 72\pi \text{ cm}^3}$$

→ Letra A.

4-1

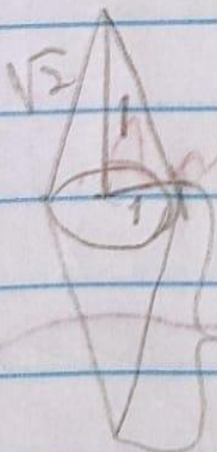
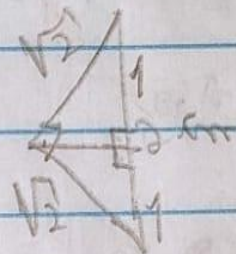


$$2^2 = x^2 + x^2$$

$$4 = 2x^2$$

$$x^2 = 2$$

$$\boxed{x = \sqrt{2}}$$

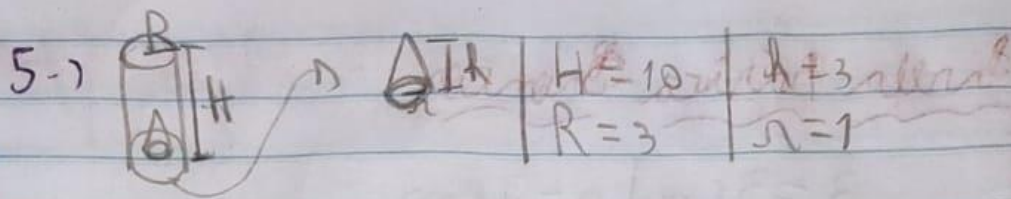


$$V = \frac{\pi \cdot 1^2 \cdot 1}{3} \Rightarrow V = \frac{\pi}{3}$$

$$\Rightarrow V = \frac{\pi}{3} \cdot 2 \Rightarrow \boxed{\frac{2\pi}{3}} \rightarrow \text{Letra E.}$$



## Exercícios 5, 6 e 7:



$$V_{\text{Recipiente}} = V_{\text{cilindro}} - V_{\text{cone}}$$

$$V_{\text{cilindro}} = \pi \cdot R^2 \cdot H$$

$$V = \pi \cdot 3^2 \cdot 10$$

$$V = \pi \cdot 9 \cdot 10$$

$$V_{\text{cilindro}} = 45\pi$$

$$V_{\text{cone}} = \frac{1}{3} \cdot \pi \cdot r^2 \cdot h$$

$$V = \frac{1}{3} \cdot \pi \cdot 1^2 \cdot 3$$

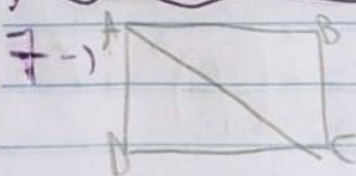
$$V_{\text{cone}} = \pi$$

$$V_{\text{Recipiente}} = 45\pi - \pi$$

$$V_{\text{Recipiente}} = 44\pi \rightarrow \text{Alternativa E.}$$

6.)  $\frac{V_{\text{Prisma}}}{V_{\text{cone}}} = \frac{\text{Área da Base do Prisma} \cdot \frac{2}{3} \cdot h}{\frac{1}{3} \cdot \text{Área da Base do Cone} \cdot h}$   $\left\{ \begin{array}{l} \text{Área da Base do Prisma} = \text{Área da Base do Cone} \\ \text{Área da Base do Cone} = \frac{2}{3} \cdot \text{Área da Base do Prisma} \end{array} \right.$

$$\frac{V_P}{V_C} = \frac{\frac{2}{3} \cdot X}{\frac{1}{3} \cdot X} \Rightarrow \frac{V_P}{V_C} = 2 \rightarrow \frac{V_{\text{Prisma}}}{V_{\text{cone}}} = 2 \rightarrow \text{Alternativa A}$$



Distanciando alguns valores:  
 $AB = 2$   $AD = 1$

$$V_{ADC} = \frac{8\pi}{3}$$

$$V_{ABC} = \frac{\pi \cdot 2^2 \cdot 1}{3} = \frac{4\pi}{3}$$

$$V_{ADC} = (\pi \cdot 2^2 \cdot 1) - V_{ABC}$$

$$V_{ADC} = \frac{4\pi}{1} - \frac{4\pi}{3} \Rightarrow V_{ADC} = \frac{12\pi - 4\pi}{3}$$

Razão:  $\frac{V_{ABC}}{V_{ADC}}$

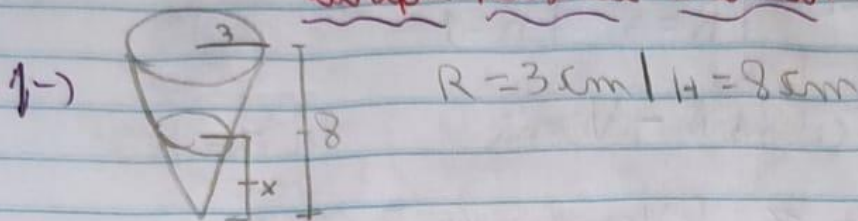
$$\frac{4\pi}{8\pi} = \frac{1}{2}$$

$$\frac{4\pi}{8\pi} = \frac{1}{2} = \frac{1}{2} \rightarrow \text{Alternativa E.}$$

## 2ª Lista – Troncos

### Exercícios 1 e 2:

#### Exercício 1 - Troncos



$$V_{\text{cone maior}} = \frac{1}{3} \cdot \pi \cdot R^2 \cdot H = \frac{1}{3} \cdot \pi \cdot 3^2 \cdot 8 = \frac{1}{3} \cdot \pi \cdot 8 \cdot 8 = \pi \cdot 3 \cdot 8 = 24\pi \text{ cm}^3$$

$$V_{\text{cone menor}} = \frac{1}{3} \cdot \pi \cdot r^2 \cdot x = \frac{1}{3} \cdot \pi \cdot 2^2 \cdot 4 = \frac{1}{3} \cdot \pi \cdot 16 \cdot 4 = \frac{64}{3}\pi \text{ cm}^3$$

$$V_{\text{cone maior}} = 24\pi \text{ cm}^3$$

Relação:  $\frac{V_{\text{cone maior}}}{V_{\text{cone menor}}} = \left(\frac{H}{h}\right)^3 \Rightarrow \frac{24\pi}{\frac{64}{3}\pi} = \frac{8^3}{x^3} \Rightarrow \frac{72}{64} = \frac{512}{x^3} \Rightarrow x^3 = \frac{512 \cdot 64}{72} = \frac{32768}{9} \Rightarrow x = \sqrt[3]{\frac{32768}{9}} \approx 15,8 \text{ cm}$

$$\therefore \frac{1}{2} = \frac{x^3}{8^3} \Rightarrow 2 \cdot x^3 = 8^3 \Rightarrow x^3 = \frac{4 \cdot 2 \cdot 8^3}{2} \Rightarrow \sqrt[3]{x^3} = \sqrt[3]{4 \cdot 2 \cdot 8^3} \Rightarrow x = 2 \cdot 2 \cdot \sqrt[3]{4} = 4\sqrt[3]{4} \text{ cm}$$

$$\therefore x = 4\sqrt[3]{4} \text{ cm} \Rightarrow \boxed{x = 4\sqrt[3]{4} \text{ cm}} \text{ na Setor E.}$$

2-)

$R = 10 \text{ cm} \quad H = 20 \text{ cm} \quad h = 15 \text{ cm}$

$$\frac{V_{\text{cone menor}}}{V_{\text{cone maior}}} = \left(\frac{h}{H}\right)^3 \Rightarrow \frac{V_{\text{cone menor}}}{V_{\text{cone maior}}} = \left(\frac{15}{20}\right)^3 \Rightarrow \frac{V_{\text{cone menor}}}{V_{\text{cone maior}}} = \left(\frac{3}{4}\right)^3 = \frac{27}{64}$$

$$\therefore \frac{V_{\text{cone menor}}}{V_{\text{cone maior}}} = \frac{512}{1000} \Rightarrow \boxed{V_{\text{cone menor}} = 51,2\%}$$

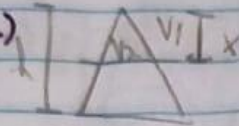
$$V_{\text{perda}} = V_{\text{cone maior}} - V_{\text{cone menor}}$$

$$V_{\text{perda}} = 100\% - 51,2\%$$

$$\boxed{V_{\text{perda}} = 48,8\% \approx 50\%} \text{ na Setor E.}$$

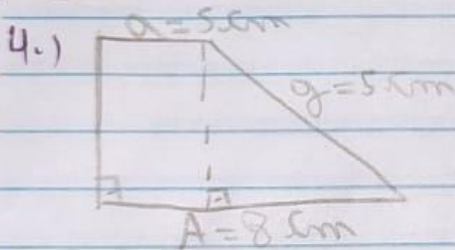


# Exercícios 3, 4 e 5:

3-1)   $\frac{V_2}{V_1} = \frac{1}{2}$

$$\frac{1}{2} = \left(\frac{x}{h}\right)^2 \Rightarrow \frac{1}{2} = \frac{x^2}{h^2} \Rightarrow h^2 = 2x^2 \Rightarrow x^2 = \frac{h^2}{2} \therefore$$

$$\therefore x = \frac{\sqrt{h^2}}{\sqrt{2}} \Rightarrow x = \frac{h}{\sqrt{2}} \cdot \sqrt{2} \Rightarrow \boxed{x = \frac{h\sqrt{2}}{2}}$$

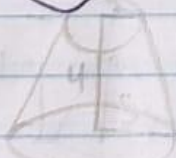


$$\begin{aligned} h^2 &= h^2 + (A-a)^2 \\ 5^2 &= h^2 + (8-a)^2 \\ 25 &= h^2 + 3^2 \\ 25 &= h^2 + 9 \Rightarrow h^2 = 25 - 9 \Rightarrow h = \sqrt{16} \end{aligned}$$

~~h = 4 cm~~

$\boxed{h = 4 \text{ cm}}$

5-1



$$V = \frac{\pi \cdot 4}{3} \cdot (5^2 + 10 + 2^2)$$

$$\begin{aligned} A_1 &= \pi \cdot 5^2 = 25\pi \\ A_2 &= 35\pi \end{aligned}$$

$$V = \frac{4\pi}{3} \cdot (25 + 10 + 4)$$

$$AB = \pi \cdot 5^2 = 25\pi$$

$$\begin{aligned} h^2 &= 4^2 + 3^2 \\ h^2 &= 16 + 9 \\ h^2 &= 25 \\ h &= 5 \text{ cm} \end{aligned}$$

$$V = \frac{4\pi \cdot 39}{3}$$

$$Ab = \pi \cdot 2^2 = 4\pi$$

$$V = \frac{156\pi}{3}$$

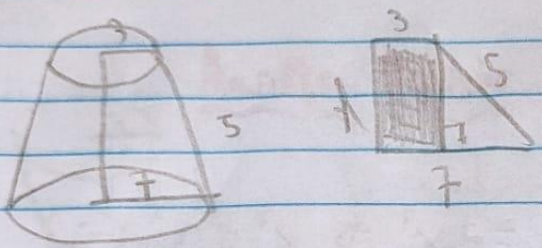
$$A = 35\pi + 25\pi + 4\pi$$

$\boxed{V = 52\pi}$

$\boxed{A = 64\pi}$

## Exercício 6:

6-1)



$$5^2 = 4^2 + h^2$$

$$h^2 = 9$$

$$h = 3 \text{ cm}$$

$$V = \frac{\pi \cdot 3}{3} (3^2 + 21 + 3^2)$$

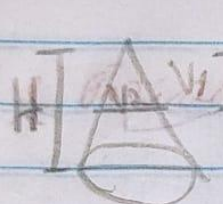
$$V = \pi \cdot 49 + 21 + 9 \Rightarrow V = 49\pi$$

→ Letra D.

O gabarito diz letra B, porém, considerando com o prof, ele disse que é D.

## Exercício 7:

7-1)



$\frac{V_2}{V_1} = \frac{1}{2}$  e  $\frac{r}{R} = \frac{1}{2}$  (semelhantes)

$\frac{1}{2} = \left(\frac{r}{R}\right)^3$   $\Rightarrow r = \frac{\sqrt[3]{4H^3}}{\sqrt{2}}$

$\frac{1}{2} = \frac{r^3}{H^3}$   $\Rightarrow r = \frac{H \cdot \sqrt[3]{2^3}}{\sqrt{2}}$

$H^3 = 2r^3$   $\Rightarrow r^3 = \frac{H^3}{2}$

$r = \frac{H \sqrt[3]{4}}{2}$  → Letra A.