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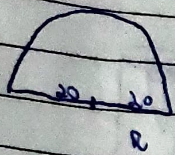
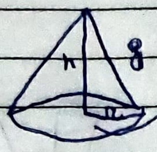
TAREFA BÁSICA - Cones e troncos

Cones

(1) $R = 20\,cm$



Comprimento da semicircunferência $= \frac{2\pi}{2}$



Comprimento da circunferência $= 2\pi r$

$\frac{2\pi R}{2} = 2\pi r$

$\frac{20}{2} = r = R = 10\,cm$

$g = 2r$

$g = 2 \cdot 10$

$g = 20\,cm \longrightarrow$ Pitágoras

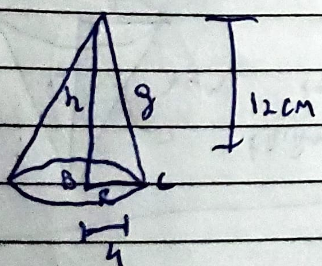
$g^2 = h^2 + r^2$

$20^2 = h^2 + 10^2$

$400 = h^2 + 100$

$h^2 = 300 \rightarrow \boxed{h = 10\sqrt{3}\,cm}$ Alternativa A

(2)



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

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

$64 = \frac{12r^2}{3}$

$r^2 = \frac{64}{4}$

$r = \sqrt{16}$

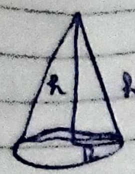
$r = 4\,cm$ //

Pitágoras

$g^2 = 12^2 + 4^2 \rightarrow g = \sqrt{160}$

$\boxed{g = 4\sqrt{10}}$ Alternativa D

③



$A = 36\pi\, cm^2$

$36\pi = \pi r^2$

$r = \sqrt{36}$

$r = 6cm$

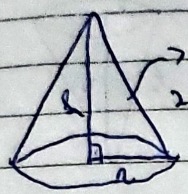
$V = \frac{1}{3} . \pi . r^2 . h$

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

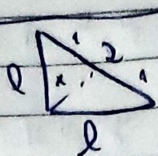
$V = \frac{216\pi}{3}$

$\boxed{V = 72\pi\, cm}$ Alternativa A

④



triângulo equilátero }



$2^2 = \ell^2 + \ell^2$

$2\ell^2 = 4$

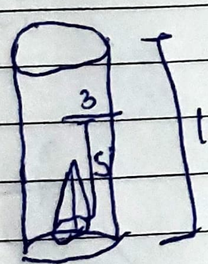
$\ell = \sqrt{2}\, cm$

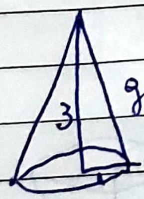
$(\sqrt{2})^2 = 1^2 + x^2 \rightarrow x^2 = 2 - 1 \Rightarrow x = 1cm$

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

$\boxed{V = 2\pi/3}$ Alternativa E

⑤





Metade da Altura do cilindro = 5

V cilindro − V cone

$V = \pi . 3^2 . 5 - \frac{1}{3} . \pi . 1^2 . 3$

$V = 45\pi - \frac{\cancel{3}\pi}{\cancel{3}}$

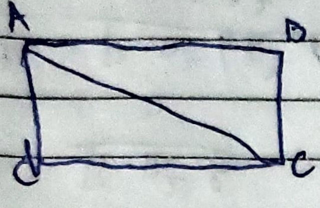
$V = 45\pi - \pi \rightarrow \boxed{V = 44\pi}$

Alternativa E

⑥ $V_{cone} = \frac{1}{3} \pi . r^2 . r$ $V_{prisma} = \pi . r^2 . \frac{2}{3} . h$

Razão $\frac{VP}{VC}$ $\left\{ \frac{\pi . r^2 . \frac{2}{3} . h}{\frac{1}{3} \pi . r^2 . h} = \frac{\frac{2}{3}}{\frac{1}{3}} \right) = \frac{6}{3} = 2$

Alternativa A

⑦ 

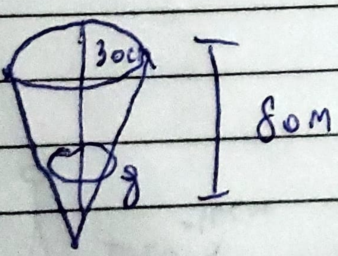
$V_{ABC} = \frac{1}{3} . \pi . x^2 . y$ $\{ V_{ABCD} = \pi . x^2 . y$

$V_{ADC} = \pi . x^2 . y - \frac{\pi . x^2 . y}{3} \Rightarrow V_{ADC} = \frac{3\pi . x^2 . y - \pi . x^2 . y}{3}$

$V_{ADC} = \frac{2\pi . x^2 . y}{3}$ //

$R = \frac{\frac{\cancel{\pi . x^2 . y}}{\cancel{3}}}{\frac{2\cancel{\pi . x^2 . y}}{\cancel{3}}} \rightarrow \boxed{R = \frac{1}{2}}$ Alternativa E

① Trancos



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

$V_{cone} = \frac{1}{3} . \pi . 3^2 . 8$

$V_{cone} = \frac{72\pi}{3} \rightarrow 24\pi cm^3$ V

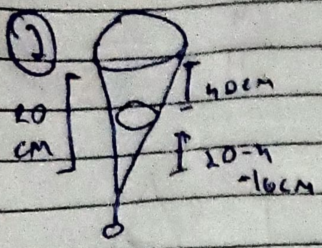
Cada liquido ocupará metade do volume do cone = $12\pi cm^3$ v

$\frac{V}{v} = \frac{H^3}{h^3} \rightarrow \frac{24\pi}{12\pi} = \frac{8^3}{h^3}$

$2 = \frac{512}{h^3} \Rightarrow h^3 = \frac{512}{2}$

$\Rightarrow h = \sqrt[3]{256} \Rightarrow h = \sqrt[3]{2^3 . 2^3 . 2^2}$

$h = 4\sqrt[3]{4} cm$ Alternativa A

(2) 

$\frac{V_{sorvete}}{V_{copo}} = \left(\frac{16}{20}\right)^3$

$V_{espuma} = V_c - V_s$

$V_e = V_c - \frac{64}{125} V_c$

$V_s = \frac{64}{125} \cdot V_c$

$V_e = 125V_c - 64V_c \to V_e = \frac{61V_c}{125}$

$\to V_e = 0{,}488 \cdot V_c \cong \boxed{50\% \, V_c}$

Alternativa C

(3) $\frac{R}{h} = \frac{r}{x} \to r = \frac{R \cdot x}{h}$

$V_{cg} = \frac{\pi R^2 \cdot h}{3}$

$V_{cp} = \frac{\pi \cdot r^2 \cdot x}{3} \to \frac{\pi \cdot \left(\frac{Rx}{h}\right)^2 \cdot x}{3} = \frac{\pi R^2 \cdot x^3}{3h^2}$

$V_t = \frac{\pi \cdot R^2 \cdot h}{3} - \frac{\pi \cdot R^2 \cdot x^3}{3h^2} \to V_t \frac{\pi R^2 \cdot h^3 \cdot \pi \cdot R^2 \cdot x^2}{3h^2}$

$V_t = \frac{\pi \cdot R^2 (h^3 - x^3)}{3h^2} \to \frac{\pi R^2 \cdot x^3}{3h^2} = \frac{\pi \cdot R^2 (h^3 - x^3)}{3h^2}$

$\pi \cdot R^2 \cdot x^3 = \pi \cdot R^2 (h^3 - x^3) \to \boxed{x^3 = h^3 - x^3}$

$2x^3 = h^3 \to x = \frac{\sqrt[3]{h^3}}{\sqrt[3]{2}} \to x = \frac{h}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2^2}}{\sqrt[3]{2^2}} \; \boxed{x = \frac{h\sqrt[3]{3}}{2}}$

(4) $5^2 = h^2 + 3^2 \to h^2 = 25 - 9 \to R = \sqrt{16} \to R = 4cm$

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(5) $AB = \pi . 2^2$

$Ab = 4\pi m^2$

$AB = \pi . 5^2$

$AB = 25\pi m^2$

$AL = \pi (5+2) . 5$

$AL = 35\pi m^2$

$g^2 = 4^2 + 3^2 \rightarrow g^2 = 16+9 \rightarrow g = \sqrt{25} \rightarrow g = 5m$

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

$\boxed{At = 64\pi . m^2}$

Area total

$V = \frac{\pi . 4}{3} (5^2 + 2^2 + 5.2)$

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

$V = \frac{52\pi m^3}{3}$ Volume

(6) $5^2 = h^2 + 4^2$

$h^2 = 25 - 16$

$h = \sqrt{9}$

$h = 3 cm$

$V = \frac{\pi . 3}{3} (7^2 + 3^2 + 7.3)$

$V = \pi (49 + 9 + 21)$

$\boxed{V = 79\pi cm^3}$ Alternativa D

(7) $\frac{R}{H} = \frac{x}{h} \rightarrow x = \frac{Rh}{H}$

$V_{cg} = \frac{\pi \cdot r^2 \cdot H}{3}$

$r_{cp} = \frac{\pi \cdot x^2 \cdot h}{3} \rightarrow V_{cp} = \frac{\pi \cdot \left(\frac{Rh}{H}\right)^2 \cdot h}{3} \rightarrow V_{cp} = \frac{\pi \cdot R^2 \cdot h^3}{3H^2}$

$V_t = \frac{\pi \cdot R^2 \cdot H}{3} - \frac{\pi \cdot R^2 \cdot h^3}{3H^2} \rightarrow V_t = \frac{\pi \cdot R^2 \cdot H^3 - \pi R^2 h^3}{3H^2}$

$V_t = \frac{\pi \cdot R^2 (H^3 - h^3)}{3H^2} \rightarrow \frac{\pi \cdot R^2 h^2}{3H^2} = \frac{\pi \cdot R^2 (H^3 - h^3)}{3H^3}$

$\pi \cdot R^2 h^3 = \pi \cdot R^2 (H^3 - h^3) \rightarrow h^3 = H^3 - h^3$

$2h^3 = H^3$

$h^3 = \frac{H^3}{2}$

$h = \frac{\sqrt[3]{H^3}}{\sqrt[3]{2}} \rightarrow h = \frac{H}{\sqrt[3]{2}}$

$h = \frac{H}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2^2}}{\sqrt[3]{2^2}}$

$h = \frac{H\sqrt[3]{4}}{2}$ Alternativa A