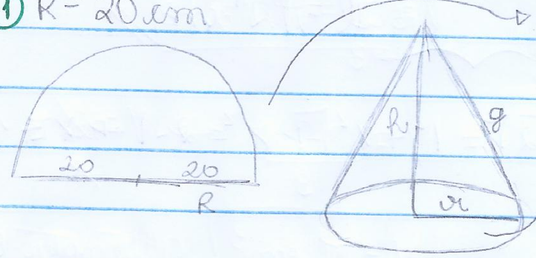
tarefa básica

CONES E TRONCOS

▶ CONES

① $R = 20\,cm$



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

Comprimento da circunferência $= 2\pi r$

$\dfrac{\cancel{2\pi} R}{2} = \cancel{2\pi} r$

$\dfrac{20}{2} = r \rightarrow r = 10\,cm$

$g = 2R$

$g = 2 \cdot 10$

$g = 20\,cm \rightarrow$ PITÁGORAS

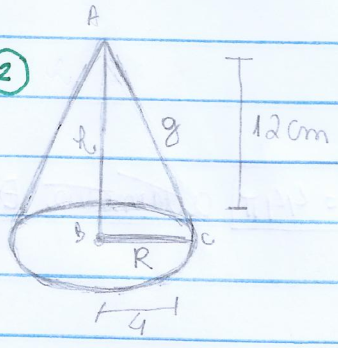
$g^2 = h^2 + r^2$

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

$400 = h^2 + 100$

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

②



$V = \dfrac{1}{3} \cdot \pi \cdot R^2 \cdot h$

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

$64 = \dfrac{12R^2}{3}$

$R^2 = \dfrac{64}{4}$

$R = \sqrt{16}$

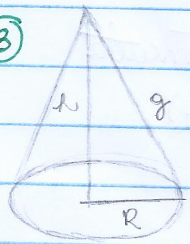
$R = 4\,cm$

PITÁGORAS

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

$\boxed{g = 4\sqrt{10}\,cm}$ Alternativa B)

③



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

$36\cancel{\pi} = \cancel{\pi} R^2$

$R = \sqrt{36}$

$R = 6\,cm$

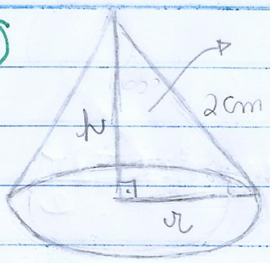
$V = \dfrac{1}{3} \cdot \pi \cdot R^2 \cdot h$

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

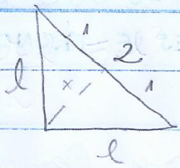
$V = \dfrac{216\pi}{3}$

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

④



2cm = g triângulo equilátero



$2^2 = l^2 + l^2$

$2l^2 = 4$

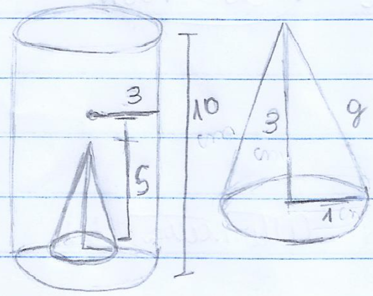
$\underbrace{l = \sqrt{2}\ cm}$ //

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

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

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

⑤



~~metade~~ da altura do cilindro = 5

$\underbrace{V\ cilindro - V\ cone}$

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

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

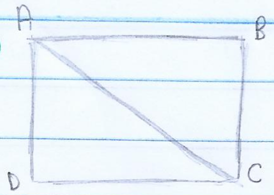
$V = 45\pi - \pi \rightarrow \boxed{V = 44\pi}$ alternativa E)

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

RAZÃO $\frac{VP}{VC}$ $\left\{ \frac{\cancel{\pi \cdot R^2} \cdot \frac{2}{3} \cdot \cancel{h}}{\frac{1}{3} \cdot \cancel{\pi \cdot R^2} \cdot \cancel{h}} = \frac{\frac{2}{3}}{\frac{1}{3}} \right) = \frac{6}{3} = 2$

alternativa A)

7



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

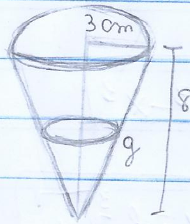
$V_{ADC} = \pi \cdot x^2 \cdot y - \frac{\pi \cdot x^2 \cdot y}{3} \rightarrow V_{ADC} = \frac{3\pi \cdot x^2 \cdot y - \pi \cdot x^2 \cdot y}{3}$

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

$R = \frac{\frac{\cancel{\pi \cdot x^2 \cdot y}}{\cancel{3}}}{\frac{\cancel{2\pi \cdot x^2 \cdot y}}{\cancel{3}}} \rightarrow \boxed{R = \frac{1}{2}}$ alternativa E)

→ TRONCOS

1



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

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

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

→ cada líquido ocupará metade do volume do cone → $12\pi \, cm^3 \rightarrow v$

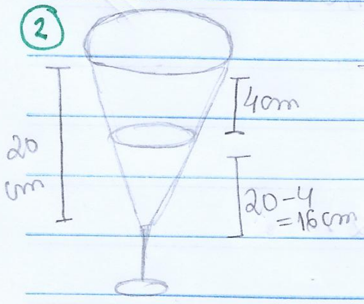
$\frac{V}{v} = \frac{H^3}{h^3} \rightarrow \frac{24\pi}{12\pi} = \frac{8^3}{h^3}$

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

$\rightarrow h = \sqrt[3]{256} \rightarrow h = \sqrt[3]{2^3 \cdot 2^3 \cdot 2^2}$

alternativa E) $\leftarrow$ $\boxed{h = 4\sqrt[3]{4} \, cm}$

2



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

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

$V_{espuma} = V_c - V_s$

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

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

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

alternativa c)

③ $\frac{R}{h} = \frac{r}{x} \rightarrow r = \frac{R.x}{h}$

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

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

$V_T = \frac{\pi . R^2 . h}{3} - \frac{\pi . R^2 . x^3}{3h^2} \rightarrow V_T = \frac{\pi . R^2 . h^3 - \pi . R^2 . x^3}{3h^2}$

$V_T = \frac{\pi . R^2 (h^3 - x^3)}{3h^2} \rightarrow \frac{\pi . R^2 . x^3}{\cancel{3h^2}} = \frac{\pi . R^2 (h^3 - x^3)}{\cancel{3h^2}}$

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

$2x^3 = h^3 \rightarrow x = \frac{\sqrt[3]{h^3}}{\sqrt[3]{2}} \rightarrow x = \frac{h}{\sqrt[3]{2}} . \frac{\sqrt[3]{2^2}}{\sqrt[3]{2^2}} \rightarrow \boxed{x = \frac{h\sqrt[3]{4}}{2}}$

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

⑤ $A_b = \pi . 2^2$ $\quad$ $AB = \pi . 5^2$ $\quad$ $\rightarrow AL = \pi (5+2) . 5$

$A_b = 4\pi\, m^2$ // $\quad$ $AB = 25\pi\, m^2$ // $\quad$ $AL = 35\pi\, m^2$ //

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

$AT = 4\pi + 25\pi + 35\pi$ $\quad$ $V = \frac{\pi . 4 (5^2 + 2^2 + 5 . 2)}{3}$

$\boxed{AT = 64\pi\, m^2}$ //

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

área total

$\boxed{V = \frac{52\pi}{3}\, m^3}$ volume

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

$h^2 = 25 - 16$

$h = \sqrt{9}$

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

$V = \dfrac{\pi \cdot 3}{3}(7^2 + 3^2 + 7 \cdot 3)$

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

$\boxed{V = 79\pi\text{ cm}^3}$ alternativa D)

(7) $\dfrac{R}{H} = \dfrac{X}{h} \rightarrow X = \dfrac{Rh}{H}$

$V_{cg} = \dfrac{\pi \cdot R^2 \cdot H}{3}$ //

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

$V_T = \dfrac{\pi \cdot R^2 \cdot H}{3} - \dfrac{\pi \cdot R^2 \cdot h^3}{3H^2} \rightarrow V_T = \dfrac{\pi \cdot R^2 \cdot H^3 - \pi \cdot R^2 \cdot h^3}{3H^2}$

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

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

$2h^3 = H^3$

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

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

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

$\boxed{h = \dfrac{H\sqrt[3]{4}}{2}}$ alternativa A)