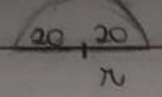
Cones

①  → comprimento da semicircunferência = $\frac{2\pi r}{2}$

 → comprimento da circunferência = $2\pi r$

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

$g = 2r$

$g = 2.10$

$g = 20cm \rightarrow g^2 = h^2 + r^2$

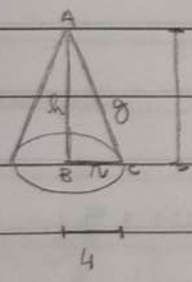
$20^2 = h^2 + 10^2$

$400 = h^2 + 100$

$h^2 = 300$

$h = 10\sqrt{3}\,cm$ (A)

$\frac{20}{2} = r \Rightarrow r = 10cm$

② 

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

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

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

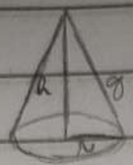
$r^2 = \frac{64}{4}$

$r = \sqrt{16}$

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

$g = 4\sqrt{10}$ (B)

/ /

③ 

$A = 36\pi\ cm^2$ $\qquad v = \frac{1}{3} \cdot \pi \cdot r^2 \cdot h$

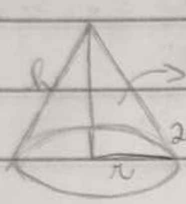
$36\pi = \pi r^2$

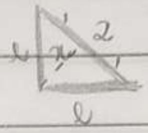
$r = \sqrt{36}$ $\qquad v = \frac{1}{3} \cdot \pi \cdot 6^2 \cdot 6$

$r = 6\ cm$

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

$v = 72\pi\ cm$ Ⓐ

④ 

→ triângulo equilátero } 

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

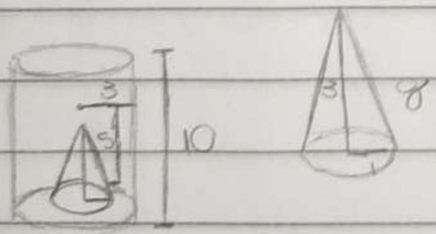
$2l^2 = 4$

$l = \sqrt{2}\ cm$

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

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

$v = \frac{2\pi}{3}$ Ⓔ

⑤ 

metade da altura do cilindro = 5

v cilindro − v cone

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

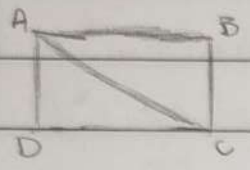
$v = 45\pi - \frac{\cancel{3}\pi}{\cancel{3}}$

$v = 45\pi - \pi \rightarrow v = 44\pi$ Ⓔ

(6) $V_{cone} = \frac{1}{3} \cdot \pi \cdot r^2 \cdot r$ $\quad V_{prisma} = \pi \cdot r^2 \cdot \frac{2}{3} \cdot h$

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

(7)



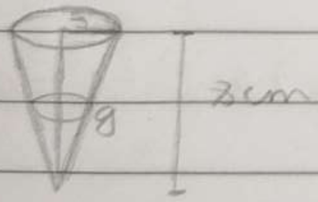
$V_{ABC} = \frac{1}{3} \cdot \pi \cdot x^2 \cdot y$ $\quad V_{ABCD} = \pi \cdot x^2 \cdot y$

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

$V_{ADC} = \frac{2\pi \cdot x^2 \cdot y}{3}$ $\quad r = \frac{\cancel{\frac{\pi \cdot x^2 \cdot y}{3}}}{\cancel{\frac{2\pi \cdot x^2 \cdot y}{3}}} \Rightarrow r = \frac{1}{2}$ (E)

Troncos

(1)



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

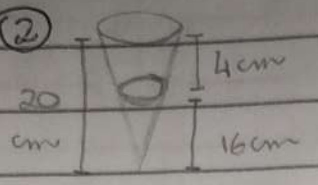
$v_{cone} = \frac{1}{3} \cdot \pi \cdot 3^2 \cdot 8$

$v_{cone} = \frac{72\pi}{3} \Rightarrow 24\pi \text{ cm}^3$

$\frac{V}{v} = \frac{H^3}{h^3} \Rightarrow \frac{24\pi}{12\pi} = \frac{8^3}{h^3} \Rightarrow 2 = \frac{512}{h^3} \Rightarrow h^3 = \frac{512}{2} \Rightarrow h = \sqrt[3]{256}$

$h = 4\sqrt[3]{4}$ (E)

(2)



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

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

$$V_{espuma} = V_c - V_x$$

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

$$V_E = \frac{125V_c - 64V_c}{125} = \frac{61V_c}{125}$$

$$\Rightarrow V_E = 0{,}488 \cdot V_c \cong 50\% \cdot V_c \quad (C)$$

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

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

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

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

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

$$\rightarrow \pi \cdot r^2 \cdot x^3 = \pi \cdot r^2 \cdot (h^3 - x^3) \Rightarrow x^3 = h^3 - x^3$$

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

(5) $A_B = \pi \cdot 2^2$ $\quad A_B = \pi \cdot 5^2$

$A_B = 4\pi\, m^2$ $\quad A_B = 25\pi\, m^2$

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

$A_L = \pi(5+2) \cdot 5$

$A_L = 35\pi\, m^2$

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

$A_T = 64\pi\ m^2$

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

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

$V = \frac{52\pi}{3}$

⑥ $5^2 = h^2 + 4^2$

$h^2 = 25 - 16$

$h = \sqrt{9}$

$h = 3$

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

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

$v = 79\pi\ cm^3$ (D)

⑦ $\frac{R}{H} = \frac{x}{h} \rightarrow x = \frac{R . h}{H}$

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

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

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

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

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

$$2h^3 = H^3$$

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

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

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

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

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