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Parte 1

1)

$$V_1 = \pi \cdot r^2 \cdot h$$

$$V_1 = \pi \cdot 10^2 \cdot \frac{1}{5} \cdot h = \pi \cdot 100 \cdot \frac{1}{5} \cdot 40$$

$$V_1 = \pi \cdot 20 \cdot 40$$

$$V_1 = 800 \pi \text{ cm}^3$$

$$V_1 = V_2$$

$$800\pi = \pi \cdot r^2 \cdot h$$

$$800\pi = \pi \cdot 5^2 \cdot h$$

$$800\pi = \pi \cdot 25 \cdot h$$

$$h = \frac{800}{25}$$

$$h = 32 \text{ cm litro A}$$

$$2) \frac{V_1}{V_2} = \frac{1}{27} \Leftrightarrow \frac{\pi(R_1)^2 \cdot h_1}{\pi(R_2)^2 \cdot h_2} = \frac{1}{27}$$

$$\Leftrightarrow \frac{(R_1)^2 \cdot 2R_1}{(R_2)^2 \cdot 16R_2} = \frac{1}{27} \Leftrightarrow \left(\frac{R_1}{R_2}\right)^3 = \frac{8}{27} \Leftrightarrow \frac{R_1}{R_2} = \frac{2}{3}$$

let's E

$$4) V = \pi \cdot r^2 \cdot h$$

$$V = \pi \cdot r^2 \cdot 4$$

$$\pi \cdot (r+12)^2 \cdot 4 = \pi \cdot r^2 \cdot (4+12)$$

$$\pi \cdot (r^2 + 24r + 144) \cdot 4 = \pi \cdot r^2 \cdot 16$$

$$\pi \cdot (4r^2 + 96r + 576) = \pi \cdot 16 \cdot r^2$$

$$4r^2 + 96r + 576 = 16r^2$$

$$4r^2 + 96r + 576 - 16r^2 = 0$$

$$-12r^2 + 96r + 576 = 0 \quad \div -12$$

$$r^2 - 8r - 48 = 0$$

$$\Delta = b^2 - 4 \cdot a \cdot c$$

$$\Delta = (-8)^2 - 4 \cdot 1 \cdot (-48)$$

$$\Delta = 64 + 192$$

$$\Delta = 256$$

$$r = \frac{-b \pm \sqrt{\Delta}}{2 \cdot a}$$

$$r = \frac{8 \pm \sqrt{256}}{2 \cdot 1}$$

$$r = \frac{8 \pm 16}{2}$$

$$r_1 = \frac{8+16}{2} = \frac{24}{2} = 12 \text{ cm letra A}$$

$$r_2 = \frac{8-16}{2} = \frac{-8}{2} = -4$$

$$5) A_{\text{bas}} = \pi r^2$$

$$A_{\text{bas}} = \pi 20^2 = 400 \pi \text{ cm}^2$$

$$r = 20 \text{ cm}; h = 0,8 \text{ mm} = 0,08 \text{ cm}$$

$$V = \pi r^2 \cdot h$$

$$V = 400 \pi \cdot 0,08$$

$$V = 32 \pi \approx 100,5 \text{ cm}^3 \text{ letra B}$$

Parte 2

$$1) \text{ bas. retâng. } \div a = x; b = 2x$$

$$h = 8$$

$$V = 48$$

$$A_{\text{bas}} = b \cdot h$$

$$A_{\text{bas}} = x \cdot 2x$$

$$A_{\text{bas}} = 2x^2 \text{ cm}^2$$

$$V = \frac{A_{\text{bas}} \cdot h}{3}$$

$$48 = \frac{2x^2 \cdot 8}{3}$$

$$16x^2 = 48 \cdot 3$$

$$x^2 = \frac{144}{16}$$

$$x^2 = 9$$

$$x = \pm \sqrt{9}$$

$x = 3$ (número positivo porque é medida)
letra C

2) A. base quadrada: $l^2 = 80^2 = 6400 \text{ mm}^2$

h da face da pirâmide:

$$h^2 = 40^2 + 30^2 \rightarrow h = 50$$

$$h^2 = 1600 + 900$$

$$h^2 = 2500$$

$$h = \pm \sqrt{2500}$$

A. face triâng. pirâmide: $\frac{l \cdot h}{2}$
 $\frac{80 \cdot 50}{2} = \frac{4000}{2} = 2000 \text{ mm}^2$

A. Tot = num. faces \cdot A. face + A. base. \rightarrow A. Tot = 14400 mm^2

A. Tot = $4 \cdot 2000 + 6400$

A. Tot = $8000 + 6400$

letra E

3) $d = l\sqrt{2}$

$$d = \sqrt{2} \cdot \sqrt{2}$$

$$d = 2$$

O raio da base é metade da diagonal, então: $\frac{d}{2} = 1$

$$r^2 = r^2 + h^2 \rightarrow h^2 = 1$$

$$(\sqrt{2})^2 = 1^2 + h^2$$

$$2 = 1 + h^2$$

$$h^2 = 2 - 1$$

$$h = \pm \sqrt{1}$$

$$h = 1 \text{ letra C}$$

$$4) A. \text{ base hexagonal} = \frac{6 \cdot l^2 \cdot \sqrt{3}}{4}$$

$$\frac{6 \cdot a^2 \cdot \sqrt{3}}{4} \div 2$$

$$\frac{3 \cdot a^2 \cdot \sqrt{3}}{2}$$

$$\frac{3\sqrt{3} a^2}{2}$$

$$V = \frac{A. \text{ base} \cdot h}{3}$$

$$V = \frac{3\sqrt{3} a^2}{2} \cdot h\sqrt{3}$$

$$V = \frac{9a^2 h}{2}$$

$$\rightarrow V = \frac{3a^2 h}{2} \text{ letra A}$$

$$5) A. \text{ base} = \frac{6 \cdot l^2 \cdot \sqrt{3}}{4}$$

$$A. \text{ base} = \frac{6 \cdot 4^2 \cdot \sqrt{3}}{4}$$

$$A. \text{ base} = \frac{6 \cdot 16 \cdot \sqrt{3}}{4} \div 4$$

$$\rightarrow A. \text{ base} = 6 \cdot 4\sqrt{3}$$

$$A. \text{ base} = 24\sqrt{3}$$

$$V = \frac{A. \text{ base} \cdot h}{3}$$

$$V = \frac{24\sqrt{3} \cdot 6\sqrt{3}}{3}$$

$$V = \frac{24 \cdot 8 \cdot 6}{3}$$

$$\rightarrow V = 24 \cdot 6$$

$$V = 144 \text{ cm}^3 \text{ letra D}$$

6) hexagonal = 6 lados. Se o perimetro da base é 6 cm, então cada lado vale 1 cm

$$h = 8 \text{ cm}$$

$$A_{\text{bas}} = \frac{6 \cdot 12\sqrt{3}}{4}$$

$$A_{\text{bas}} = \frac{6 \cdot 12\sqrt{3}}{4}$$

$$A_{\text{bas}} = \frac{6 \cdot 12\sqrt{3}}{4} \div 2$$

$$A_{\text{bas}} = \frac{3 \cdot 12\sqrt{3}}{2}$$

$$A_{\text{bas}} = \frac{36\sqrt{3}}{2}$$

$$V = \frac{A_{\text{bas}} \cdot h}{3}$$

$$V = \frac{36\sqrt{3}}{2} \cdot 8$$

$$V = \frac{36\sqrt{3}}{2} \cdot 8 \div 2$$

$$V = \frac{36\sqrt{3} \cdot 4}{3}$$

$$V = 12\sqrt{3} \cdot 4$$

$$V = 48\sqrt{3} \text{ cm}^3 \text{ letra A}$$

7) Base qua. pirâm: lado 2a
 $V_{\text{pirâm}} = V_{\text{pris.}}$
 Base qua. pris.: lado a

$$V = \frac{(2a)^2 \cdot h}{3}$$

$$V = \frac{4a^2 \cdot h}{3}$$

$$V = A_{\text{b}} \cdot h$$

$$V = a^2 \cdot h$$

$$\text{razão entre as } h = \frac{4a^2 \cdot h}{3 \cdot 1}$$

$$= \frac{4}{3} \text{ letra A}$$

$$8) A. \text{Tetra.} = \text{aresta}^2 \sqrt{3} \quad \star a = \sqrt{6}$$

$$6\sqrt{3} = a^2 \sqrt{3}$$

$$a^2 = \frac{6\sqrt{3}}{\sqrt{3}}$$

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

$$a^2 = 6$$

$$h \text{ de um tetraedro: } \frac{a\sqrt{6}}{3}$$

$$\frac{\sqrt{6} \cdot \sqrt{6}}{3}$$

$$\frac{6}{3} = 2 \text{ cm letra A}$$