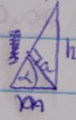
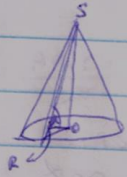


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(1c)



$$h = m \tan \alpha$$

$$a = m \sin \alpha$$

$$m = \frac{a}{\sin \alpha}$$

$$R = m \cos \alpha \rightarrow m = \frac{R}{\cos \alpha}$$

$$R = \frac{2m}{\sqrt{3}}$$

$$V = \frac{1}{3} \pi R^2 h = \frac{1}{3} \pi \left(\frac{2m}{\sqrt{3}} \right)^2 \cdot m \tan \alpha = \frac{4m^3 \tan \alpha}{9} = \frac{4a^3 \tan \alpha}{9 \sin^3 \alpha}$$

$$V = \frac{4a^3 \pi}{9 \sin^3 \alpha \cos \alpha}$$

(2) $\frac{S_{\text{side}}}{S_{\text{base}}} = \pi R l + \pi R^2 = \pi \frac{2m}{\sqrt{3}} l + \pi \cdot \frac{4m^2}{3} =$

$$= \pi \frac{2a}{\sqrt{3} \sin \alpha} \sqrt{\frac{4a^2}{3 \sin^2 \alpha} + \frac{a^2}{\cos^2 \alpha}} + \frac{4a^2 \pi}{3 \sin^2 \alpha}$$



$$l = \sqrt{R^2 + h^2} = \sqrt{\frac{4a^2}{3 \sin^2 \alpha} + \frac{a^2}{\cos^2 \alpha}}$$

$$= \frac{2a \pi}{3 \sin^2 \alpha \cos \alpha} \sqrt{4 \cos^2 \alpha + 3 \sin^2 \alpha} + \frac{4a^2 \pi}{3 \sin^2 \alpha} = \frac{2a^2 \pi}{3 \sin^2 \alpha} \left(\sqrt{4 \cos^2 \alpha + 3 \sin^2 \alpha} + 2 \cos \alpha \right)$$