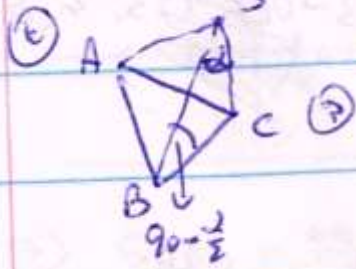


3.73
6



$$\frac{2R}{\sin \alpha} = \frac{BC}{\sin \alpha} \rightarrow BC = 2R \sin \alpha$$

$$R_{\text{circ}} = \frac{\sqrt{3}}{3} = 2R \sin \alpha$$

$$\frac{SC}{\cos \frac{\alpha}{2}} = 2R \rightarrow SC = 2R \cos \frac{\alpha}{2}$$

$$h = \sqrt{SC^2 - R_{\text{circ}}^2} = \sqrt{4R^2 \cos^2 \frac{\alpha}{2} - \frac{4R^2 \sin^2 \alpha}{3}} = \frac{2R}{\sqrt{3}} \sqrt{3 \cos^2 \frac{\alpha}{2} - \sin^2 \alpha}$$

$$V = \frac{1}{3} \cdot S_{\text{base}} \cdot h = \frac{1}{3} \cdot \frac{\sqrt{3}}{4} \cdot 4R^2 \sin^2 \alpha \cdot \frac{2R}{\sqrt{3}} \sqrt{3 \cos^2 \frac{\alpha}{2} - \sin^2 \alpha} =$$

$$= \frac{2R^3}{3} \sin^2 \alpha \sqrt{3 \cos^2 \frac{\alpha}{2} - \sin^2 \alpha}$$