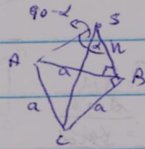


3.77
5 (c)



$$\triangle SBC: \sin \alpha = \frac{a}{\sqrt{a^2+h^2}}$$

$$\triangle ASC: a^2 = 2(a^2+h^2) - 2(a^2+h^2) \sin \alpha$$

$$\sin \alpha = \frac{a^2+2h^2}{2a^2+2h^2}$$

sin - 0 (p 118)

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

$$2a\sqrt{a^2+h^2} = a^2+2h^2$$

$$4a^2(a^2+h^2) = a^4+4a^2h^2+4h^4$$

$$3a^4 = 4h^4 \rightarrow a = \sqrt[4]{\frac{4}{3}} h$$

$$\tan \alpha = \frac{a}{h} = \sqrt[4]{\frac{4}{3}} \rightarrow 1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \rightarrow 1 + \sqrt{\frac{4}{3}} = \frac{1}{\cos^2 \alpha}$$

$$1 + \frac{2}{\sqrt{3}} = \frac{1}{\cos^2 \alpha} \rightarrow \frac{\sqrt{3}+2}{\sqrt{3}} = \frac{1}{\cos^2 \alpha} \rightarrow \cos^2 \alpha = \frac{\sqrt{3}}{\sqrt{3}+2} \cdot \frac{\sqrt{3}-2}{\sqrt{3}-2} = \frac{3-2\sqrt{3}}{-1} = 2\sqrt{3}-3$$

$$\cos \alpha = \sqrt{2\sqrt{3}-3}$$

q.m. p.m. n.m. n.m.

$$\cos(90-\alpha) = \sin \alpha = \frac{a^2+2h^2}{2a^2+2h^2} = \frac{a^2+\sqrt{3}a^2}{2a^2+\sqrt{3}a^2} = \frac{1+\sqrt{3}}{2+\sqrt{3}} \cdot \frac{2-\sqrt{3}}{2-\sqrt{3}} = \sqrt{3}-1$$

$$\textcircled{+} V = \frac{1}{3} \cdot \frac{\sqrt{3}}{4} a^2 h = \frac{1}{3} \cdot \frac{\sqrt{3}}{4} \cdot \sqrt[4]{\frac{4}{3}} h^2 \cdot h = \frac{2\sqrt{3}}{12\sqrt{3}} h^3 = \frac{h^3}{6}$$