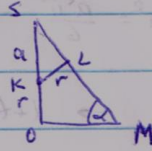
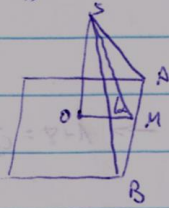


4.25
6



$$\frac{SK}{SM} = \frac{KL}{OM}$$

$$\frac{a}{a+r} = \frac{r}{\frac{a+r}{\tan \alpha}}$$

$$\boxed{r = a \cos \alpha}$$

$$AB = 2OM = \frac{2(a+r)}{\tan \alpha} = \frac{2a(1+\cos \alpha)}{\tan \alpha}$$

$$S_{ABCD} = AB^2 = \frac{4a^2(1+\cos \alpha)^2}{\tan^2 \alpha} = 4a^2(1+\cos \alpha)^2 \cot^2 \alpha$$

$$SK = \frac{a+r}{\sin \alpha} = \frac{a(1+\cos \alpha)}{\sin \alpha} = \frac{2a \cos^2 \frac{\alpha}{2}}{2 \sin \frac{\alpha}{2} \cos \frac{\alpha}{2}} = a \cot \frac{\alpha}{2}$$

$$S_{\text{pyramid}} = \frac{SK \cdot AB}{2} = \frac{2a(1+\cos \alpha)}{\tan \alpha} \cdot \frac{a(1+\cos \alpha)}{\sin \alpha} = \frac{a^2(1+\cos \alpha)^2 \cos \alpha}{\sin^2 \alpha}$$

$$S_{\text{total}} = S_{ABCD} + 4S_{\text{triangle}} = 4a^2(1+\cos \alpha)^2 \cot^2 \alpha + \frac{4a^2(1+\cos \alpha)^2 \cos \alpha}{\sin^2 \alpha}$$

$$= 4a^2(1+\cos \alpha)^2 \cot^2 \alpha \left[\cot^2 \alpha + \frac{1}{\sin^2 \alpha} \right] = 4a^2(1+\cos \alpha)^2 \cot^2 \alpha \left(\frac{\cot^2 \alpha + 1}{\sin^2 \alpha} \right)$$

$$= \frac{4a^2(1+\cos \alpha)^3 \cot^2 \alpha}{\sin^2 \alpha} = \frac{4a^2(2 \cos^2 \frac{\alpha}{2})^3 \cdot \cos \alpha}{\sin^2 \alpha} =$$

$$= \frac{4a^2 \cdot 8 \cos^6 \frac{\alpha}{2} \cdot \cos \alpha}{4 \sin^2 \frac{\alpha}{2} \cos^2 \frac{\alpha}{2}} = 8a^2 \frac{\cos^4 \frac{\alpha}{2}}{\sin^2 \frac{\alpha}{2}} \cos \alpha = 8a^2 \cot^2 \frac{\alpha}{2} \cdot \cos \alpha$$