

$$\textcircled{69} \quad \textcircled{2} \quad \tan \frac{\alpha}{2} = \frac{1 - \cos \alpha}{\sin \alpha} \quad \text{v.s.}$$

$$\frac{1}{2 \sin^2 \frac{\alpha}{2}} = \frac{\sin^2 \alpha - \cos \alpha (1 - \cos \alpha)}{\sin^2 \alpha} = \frac{\sin^2 \alpha - \cos \alpha + \cos^2 \alpha}{\sin^2 \alpha} = \frac{1 - \cos \alpha}{\sin^2 \alpha}$$

$$\textcircled{7} \quad \frac{1}{2 \sin^2 \frac{\alpha}{2}} \cdot \frac{\sin \frac{\alpha}{2}}{\cos \frac{\alpha}{2}} = \frac{1 - \cos \alpha}{\sin^2 \alpha} \cdot \frac{1 - \cos \alpha}{\sin \alpha}$$

כבר ידוע כי $\sin \alpha = 2 \sin \frac{\alpha}{2} \cos \frac{\alpha}{2}$

$$\frac{\sin \frac{\alpha}{2}}{2 \sin^2 \frac{\alpha}{2}} = \frac{(1 - \cos \alpha)^2}{\sin^2 \alpha}$$