

$$A = \lim_{x \rightarrow 1} (1-x)^{\cos \frac{\pi x}{2}}$$

$$\ln A = \ln \lim_{x \rightarrow 1} (1-x)^{\cos \frac{\pi x}{2}} = \lim_{x \rightarrow 1} \ln (1-x)^{\cos \frac{\pi x}{2}} = \lim_{x \rightarrow 1} \cos \frac{\pi x}{2} \ln (1-x) = \lim_{x \rightarrow 1} \frac{\ln (1-x)}{\frac{1}{\cos \frac{\pi x}{2}}}$$

$$\ln A = \lim_{x \rightarrow 1} \frac{-\frac{1}{(1-x)}}{-\frac{\pi}{2} \sin \frac{\pi x}{2}} = \lim_{x \rightarrow 1} \frac{2}{\pi} \frac{\cos^2 \frac{\pi x}{2}}{\sin \frac{\pi x}{2} (1-x)}$$

$$\frac{\cos^2 \frac{\pi x}{2}}{2}$$