





$$\frac{v}{c} = \tan \alpha = \frac{(\gamma - \frac{1}{\gamma})}{\frac{v \cdot \gamma}{c}}$$

$$\frac{v^2}{c^2} = 1 - \frac{1}{\gamma^2}$$

$$\frac{1}{\gamma^2} = 1 - \frac{v^2}{c^2} \Rightarrow \gamma = \frac{1}{\sqrt{1 - v^2/c^2}}$$