

2.48
→ 8

$$\sin \alpha = \frac{3}{5}$$

$$\cos \alpha = \frac{2 \sin \frac{\alpha}{2} \cos \frac{\alpha}{2}}{\sin^2 \alpha + \cos^2 \alpha} = \frac{2 \tan \frac{\alpha}{2}}{\tan^2 \frac{\alpha}{2} + 1}$$

$$\cos \alpha = \frac{3}{5} = \frac{2x}{1+x^2}$$

$$\tan \frac{\alpha}{2} = x \quad (x > 0)$$

$$2x^2 - 10x + 3 = 0$$

$$x = 3 \rightarrow \tan \frac{\alpha}{2} = 3$$

$$x = \frac{1}{3} \rightarrow \tan \frac{\alpha}{2} = \frac{1}{3}$$

$$\tan \alpha = \frac{2 \tan \frac{\alpha}{2}}{1 - \tan^2 \frac{\alpha}{2}}$$

→ wenn $\tan \frac{\alpha}{2} = 3$ → dann ist α im 1. Quadranten

$$\tan \frac{\alpha}{2} = \frac{1}{3} \rightarrow \tan \alpha = \frac{2 \cdot \frac{1}{3}}{1 - \frac{1}{9}} = \frac{\frac{2}{3}}{\frac{8}{9}} = \frac{2}{3} \cdot \frac{9}{8} = \frac{18}{24} = \frac{3}{4}$$

→ $0 < \alpha < \frac{\pi}{2}$ → dann ist α im 1. Quadranten

$$\boxed{\tan \frac{\alpha}{2} = 3} \rightarrow \tan \alpha = \frac{6}{1-9} = \frac{6}{-8} = -\frac{3}{4}$$

→ $\frac{\pi}{2} < \alpha < \pi$ → dann ist α im 2. Quadranten