

Zadatak 8. Ako je $\cos \alpha = \frac{21}{29}$, $-\frac{\pi}{2} < \alpha < 0$, izračunaj $\operatorname{ctg} \frac{\alpha}{2}$.

Rješenje. $-\frac{\pi}{2} < \alpha < 0 \implies -\frac{\pi}{4} < \frac{\alpha}{2} < 0 \implies \sin \frac{\alpha}{2} < 0, \cos \frac{\alpha}{2} > 0:$

$$\cos \frac{\alpha}{2} = \sqrt{\frac{1 + \cos \alpha}{2}} = \sqrt{\frac{1 + \frac{21}{29}}{2}} = \sqrt{\frac{\frac{50}{29}}{2}} = \sqrt{\frac{25}{29}} = \frac{5}{\sqrt{29}}$$

$$\sin \frac{\alpha}{2} = -\sqrt{1 - \cos^2 \frac{\alpha}{2}} = -\sqrt{1 - \frac{25}{29}} = -\sqrt{\frac{4}{29}} = -\frac{2}{\sqrt{29}}$$

$$\operatorname{ctg} \frac{\alpha}{2} = \frac{\cos \frac{\alpha}{2}}{\sin \frac{\alpha}{2}} = \frac{\frac{5}{\sqrt{29}}}{-\frac{2}{\sqrt{29}}} = -\frac{5}{2}.$$