

Zadatak 6. Ako je $\sin \alpha = -\frac{15}{17}$, $\pi < \alpha < \frac{3\pi}{2}$, koliko je $\sin \frac{\alpha}{2}$ i koliko je $\cos \frac{\alpha}{2}$?

Rješenje. $\pi < \alpha < \frac{3\pi}{2} \implies \cos \alpha < 0$:

$$\frac{\pi}{2} < \frac{\alpha}{2} < \frac{3\pi}{4} \implies \sin \frac{\alpha}{2} > 0, \cos \frac{\alpha}{2} < 0:$$

$$\cos \alpha = -\sqrt{1 - \sin^2 \alpha} = -\sqrt{1 - \frac{225}{289}} = -\frac{8}{17}$$

$$\sin \frac{\alpha}{2} = \sqrt{\frac{1 - \cos \alpha}{2}} = \sqrt{\frac{1 + \frac{8}{17}}{2}} = \sqrt{\frac{\frac{25}{17}}{2}} = \sqrt{\frac{25}{34}} = \frac{5}{\sqrt{34}}$$

$$\cos \frac{\alpha}{2} = -\sqrt{\frac{1 + \cos \alpha}{2}} = -\sqrt{\frac{1 - \frac{8}{17}}{2}} = -\sqrt{\frac{\frac{9}{17}}{2}} = -\sqrt{\frac{9}{34}} = -\frac{3}{\sqrt{34}}$$