

**Zadatak 10.** Ako je  $\sin\left(x - \frac{\pi}{2}\right) = -\frac{2}{3}$ ,  $\frac{3\pi}{2} < x < 2\pi$ , izračunaj  $\operatorname{ctg} 2x$ .

**Rješenje.**  $\frac{3\pi}{2} < x < 2\pi \implies \sin < 0$

$$\sin\left(x - \frac{\pi}{2}\right) = \underbrace{\sin x \cos \frac{\pi}{2}}_{=0} - \underbrace{\cos x \sin \frac{\pi}{2}}_{=1} = -\cos x = -\frac{2}{3} \implies \cos x = \frac{2}{3}$$

$$\sin x = -\sqrt{1 - \cos^2 x} = -\sqrt{1 - \frac{4}{9}} = -\sqrt{\frac{5}{9}} = -\frac{\sqrt{5}}{3}$$

$$\operatorname{ctg} x = \frac{\cos x}{\sin x} = \frac{\frac{2}{3}}{-\frac{\sqrt{5}}{3}} = -\frac{2}{\sqrt{5}}$$

$$\operatorname{ctg} 2x = \frac{\operatorname{ctg}^2 x - 1}{2 \operatorname{ctg} x} = \frac{\frac{4}{5} - 1}{2 \cdot \left(-\frac{2}{\sqrt{5}}\right)} = \frac{-\frac{1}{5}}{-\frac{4}{\sqrt{5}}} = \frac{\sqrt{5}}{20}$$