Zadatak 14. Ako je $\sin\left(\frac{\pi}{4}-x\right)=-\frac{2}{3}$, $\frac{\pi}{4}<x<\frac{\pi}{2}$, izračunaj $\sin x$.

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

$$\cos\left(\frac{\pi}{4}-x\right)=\sqrt{1-\sin^2\left(\frac{\pi}{4}-x\right)}=\sqrt{1-\frac{4}{9}}=\frac{\sqrt{5}}{3}$$

$$\sin\left(\frac{\pi}{4}-x\right)=\sin\frac{\pi}{4}\cos x-\cos\frac{\pi}{4}\sin x=-\frac{2}{3}$$

$$\cos\left(\frac{\pi}{4}-x\right)=\cos\frac{\pi}{4}\cos x+\sin\frac{\pi}{4}\sin x=\frac{\sqrt{5}}{3}$$

$$\left.\begin{aligned}\frac{\sqrt{2}}{2}\cos x-\frac{\sqrt{2}}{2}\sin x&=-\frac{2}{3}\\ \frac{\sqrt{2}}{2}\cos x+\frac{\sqrt{2}}{2}\sin x&=\frac{\sqrt{5}}{3}\end{aligned}\right\}+$$

$$2\cdot\frac{\sqrt{2}}{2}\cos x=\frac{-2+\sqrt{5}}{3}\quad /:\sqrt{2}$$

$$\cos x=\frac{-2+\sqrt{5}}{3\sqrt{2}}$$

$$\left.\begin{aligned}-\frac{\sqrt{2}}{2}\cos x+\frac{\sqrt{2}}{2}\sin x&=\frac{2}{3}\\ \frac{\sqrt{2}}{2}\cos x+\frac{\sqrt{2}}{2}\sin x&=\frac{\sqrt{5}}{3}\end{aligned}\right\}+$$

$$2\cdot\frac{\sqrt{2}}{2}\sin x=\frac{2+\sqrt{5}}{3}\quad /:\sqrt{2}$$

$$\sin x=\frac{2+\sqrt{5}}{3\sqrt{2}}$$