Zadatak 7.   Razlomak $\dfrac{\sin x + \operatorname{tg} x}{\cos x + \operatorname{ctg} x}$ uvijek je pozitivan, za svaku vrijednost realnog broja x za koji je $\cos x + \operatorname{ctg} x \neq 0$. Dokaži!

Rješenje. $\cos x + \operatorname{ctg} x \neq 0$

$$\frac{\sin x + \operatorname{tg} x}{\cos x + \operatorname{ctg} x} = \frac{\sin x + \dfrac{\sin x}{\cos x}}{\cos x + \dfrac{\cos x}{\sin x}} = \frac{\dfrac{\sin x(1 + \cos x)}{\cos x}}{\dfrac{\cos x(1 + \sin x)}{\sin x}} = \frac{\sin^2 x(1 + \cos x)}{\cos^2 x(1 + \sin x)};$$

$$\left.\begin{array}{r}\sin^2 x \geqslant 0 \\[4pt] \cos^2 x \geqslant 0 \\[4pt] -1 \leqslant \sin x \leqslant 1 \implies \sin x + 1 \geqslant 0 \\[4pt] -1 \leqslant \cos x \leqslant 1 \implies \cos x + 1 \geqslant 0\end{array}\right\} \implies \frac{\sin^2 x(1 + \cos x)}{\cos^2 x(1 + \sin x)} \geqslant 0.$$