Zadatak 21.

1) $\dfrac{\sin x+\cos x}{\sin x-\cos x}>\sqrt{3}\,;$

2) $\left|\dfrac{\sin x-\cos x}{\sin x+\cos x}\right|\leqslant 1\,;$

3) $\dfrac{\sin 2x-\cos 2x+1}{\sin 2x+\cos 2x-1}>0\,.$

Rješenje. **1)**

$$\frac{\sin x+\cos x}{\sin x-\cos x}\begin{matrix}/:\cos x\\ /:\cos x\end{matrix}>\sqrt{3}$$

$$\frac{\operatorname{tg} x+1}{\operatorname{tg} x-1}>\sqrt{3}$$

$$-\frac{\operatorname{tg} x+\operatorname{tg}\frac{\pi}{4}}{1-\operatorname{tg} x\operatorname{tg}\frac{\pi}{4}}>\sqrt{3}$$

$$-\operatorname{tg}\left(x+\frac{\pi}{4}\right)>\sqrt{3}\quad /\cdot(-1)$$

$$\operatorname{tg}\left(x+\frac{\pi}{4}\right)<-\sqrt{3}$$

$$\frac{\pi}{2}+k\pi<x+\frac{\pi}{4}<\frac{2\pi}{3}+k\pi$$

$$\frac{\pi}{4}+k\pi<x<\frac{5\pi}{12}+k\pi,\quad k\in\mathbf{Z}$$

2)

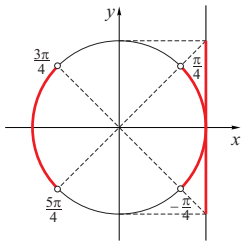
$$\left|\frac{\sin x-\cos x}{\sin x+\cos x}\begin{matrix}/:\cos x\\ /:\cos x\end{matrix}\right|\leqslant 1$$

$$\left|\frac{\operatorname{tg} x-1}{\operatorname{tg} x+1}\right|\leqslant 1$$

$$\left|\frac{\operatorname{tg} x-\operatorname{tg}\frac{\pi}{4}}{1+\operatorname{tg} x\cdot\operatorname{tg}\frac{\pi}{4}}\right|\leqslant 1$$

$$\left|\operatorname{tg}\left(x-\frac{\pi}{4}\right)\right|\leqslant 1$$

$$-1\leqslant\operatorname{tg}\left(x-\frac{\pi}{4}\right)\leqslant 1$$



$$-\frac{\pi}{4}+k\pi\leqslant x-\frac{\pi}{4}\leqslant\frac{\pi}{4}+k\pi$$

$$k\pi\leqslant x\leqslant\frac{\pi}{2}+k\pi,\quad k\in\mathbf{Z}$$

3)

$$\frac{\sin 2x - \cos 2x + 1}{\sin 2x + \cos 2x - 1} > 0$$

$$\frac{2\sin x\cos x - \cos^2 x + \sin^2 x + 1}{2\sin x\cos x + \cos^2 x - \sin^2 x - 1} > 0$$

$$\frac{2\sin x\cos x + 2\sin^2 x}{2\sin x\cos x - 2\sin^2 x} > 0$$

$$\frac{2\sin x(\cos x + \sin x)}{2\sin x(\cos x - \sin x)} > 0$$

$$\frac{\cos x + \sin x}{\cos x - \sin x}\begin{matrix} /:\cos x \\ /:\cos x \end{matrix} > 0$$

$$\frac{1 + \operatorname{tg} x}{1 - \operatorname{tg} x} > 0$$

$$\frac{\operatorname{tg}\frac{\pi}{4} + \operatorname{tg} x}{1 - \operatorname{tg}\frac{\pi}{4}\operatorname{tg} x} > 0$$

$$\operatorname{tg}\left(x + \frac{\pi}{4}\right) > 0$$

$$k\pi < x + \frac{\pi}{4} < \frac{\pi}{2} + k\pi$$

$$-\frac{\pi}{4} + k\pi < x < \frac{\pi}{4} + k\pi, \quad k \in \mathbf{Z}$$