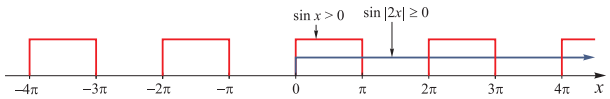
Zadatak 2. Nacrtaj graf funkcije

1) $f(x) = \dfrac{\sin|2x|}{|\sin x|}$; **2)** $f(x) = \dfrac{\sin|2x|}{|\cos x|}$.

Rješenje. **1)** $f(x) = \dfrac{\sin|2x|}{|\sin x|}$

$$\sin|2x| = \begin{cases} \sin 2x & x \geqslant 0 \\ -\sin 2x & x < 0 \end{cases}$$

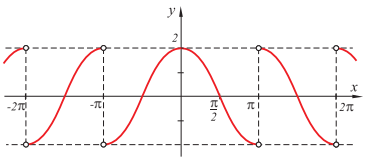
$$|\sin x| = \begin{cases} \sin x & 2k\pi \leqslant x \geqslant (2k+1)\pi \\ -\sin 2x & (2k+1)\pi < x < (2k+2)\pi \end{cases}$$



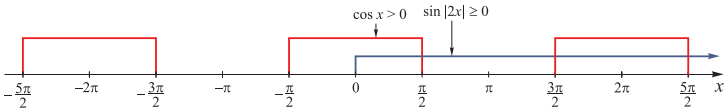
$$\begin{aligned} &\sin x \geqslant 0,\ \sin 2x \leqslant 0 \quad x \in [-2k\pi, (-2k+1)\pi]; \\ &\sin x \leqslant 0,\ \sin 2x \leqslant 0 \quad x \in [(-2k-1)\pi, -2k\pi]; \\ &\sin x \geqslant 0,\ \sin 2x \geqslant 0 \quad x \in [2k\pi, (2k+1)\pi]\pi; \\ &\sin x \leqslant 0,\ \sin 2x \geqslant 0 \quad x \in [(2k+1)\pi, (2k+2)\pi]\pi; \end{aligned} \qquad k \in \mathbf{N}$$

$$f(x) = \begin{cases} \dfrac{-2\sin x\cos x}{\sin x}, & x \in [-2k\pi, (-2k+1)\pi] \\ \dfrac{-2\sin x\cos x}{-\sin x}, & x \in [(-2k-1)\pi, -2k\pi] \\ \dfrac{2\sin x\cos x}{\sin x}, & x \in [2k\pi, (2k+1)\pi] \\ \dfrac{2\sin x\cos x}{-\sin x}, & x \in [(2k+1)\pi, (2k+2)\pi] \end{cases}$$

$$= \begin{cases} -\cos x, & x \in [-2k\pi, (-2k+1)\pi] \cup [(2k+1)\pi, (2k+2)\pi] \\ \cos x, & x \in [(-2k-1)\pi, -2k\pi] \cup [2k\pi, (2k+1)\pi] \end{cases}$$



2) $f(x) = \dfrac{\sin|2x|}{|\cos x|}$



$$f(x)=\begin{cases}\dfrac{-2\sin x\cos x}{-\cos x}, & x\in\left[\dfrac{-2k-1}{2}\pi,\dfrac{-2k+1}{2}\pi\right]\\ \dfrac{-2\sin x\cos x}{\cos x}, & x\in\left[\dfrac{-2k+1}{2}\pi,\dfrac{-2k+3}{2}\pi\right]\\ \dfrac{2\sin x\cos x}{-\cos x}, & x\in\left[\dfrac{2k-1}{2}\pi,\dfrac{2k+1}{2}\pi\right]\\ \dfrac{2\sin x\cos x}{\cos x}, & x\in\left[\dfrac{2k+1}{2}\pi,\dfrac{2k+3}{2}\pi\right]\end{cases}$$

$$=\begin{cases}2\sin x, & x\in\left[\dfrac{-2k-1}{2}\pi,\dfrac{-2k+1}{2}\pi\right]\cup\left[\dfrac{2k+1}{2}\pi,\dfrac{2k+3}{2}\pi\right]\\ -\sin x, & x\in\left[\dfrac{-2k+1}{2}\pi,\dfrac{-2k+3}{2}\pi\right]\cup\left[\dfrac{2k-1}{2}\pi,\dfrac{2k+1}{2}\pi\right]\end{cases}\qquad k\in\mathbf{N}\cup\{0\}$$