Zadatak 19. Grafički prikaži sljedeće funkcije:

1) $f(x) = 10^{\log(|x+1|-2)}$;

2) $f(x) = e^{\ln(x^2-4x+3)}$;

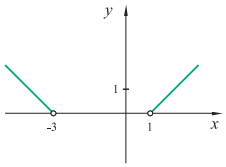
3) $f(x) = e^{\ln(\sin x)}$;

4) $f(x) = 3^{\log_3(\cos x)}$.

Rješenje. **1)** Uvjet za postojanje funkcije: $|x+1|-2>0,\ \ |x+1|>2 \implies x<-3$ ili $x>1$;

Za $x \in \langle -\infty, -3\rangle \cup \langle 1, \infty\rangle$:

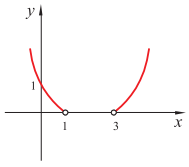
$$f(x) = 10^{\log(|x+1|-2)} = |x+1|-2;$$



2) Uvjet za postojanje funkcije: $x^2-4x+3>0,\ \ (x-3)(x-1)>0 \implies x<1$ ili $x>3$;

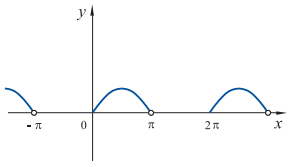
Za $x \in \langle -\infty, 1\rangle \cup \langle 3, \infty\rangle$:

$$f(x) = e^{\ln(x^2-4x+3)} = x^2-4x+3 = (x-3)(x-1);$$



3) Uvjet za postojanje funkcije: $\sin x > 0 \implies x \in \langle 2k\pi, \pi+2k\pi\rangle$, $k \in \mathbf{Z} \implies$

$$f(x) = e^{\ln(\sin x)} = \sin x, \ \text{ za } x \in \langle 2k\pi, \pi+2k\pi\rangle;$$



4) Uvjet za postojanje funkcije: $\cos x > 0 \implies x \in \left\langle -\frac{\pi}{2}+2k\pi, \frac{\pi}{2}+2k\pi\right\rangle$, $k \in \mathbf{Z} \implies$

$$f(x) = 3^{\log_3(\cos x)} = \cos x, \ \text{ za } x \in \left\langle -\frac{\pi}{2}+2k\pi, \frac{\pi}{2}+2k\pi\right\rangle.$$