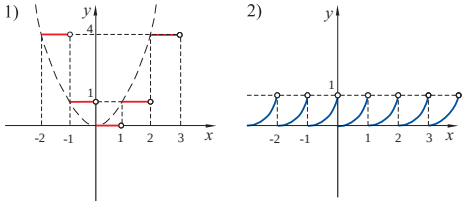
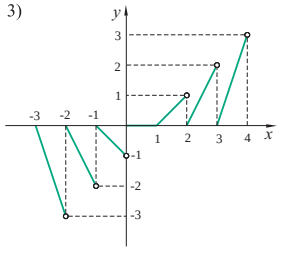
Zadatak 16. Grafički prikaži funkcije:

1) $f(x) = \lfloor x \rfloor^2$;
2) $f(x) = \{x\}^2$;
3) $f(x) = \lfloor x \rfloor \{x\}$;
4) $f(x) = \lfloor \sin x \rfloor$;
5) $f(x) = \{\cos x\}$.

Rješenje. **1)** Promatraju se vrijednosti funkcije po intervalima $[n, n+1\rangle$, $n \in \mathbf{Z}$. Vidi sliku 1. **2)** Vidi sliku 2. **3)** Vidi sliku 3.



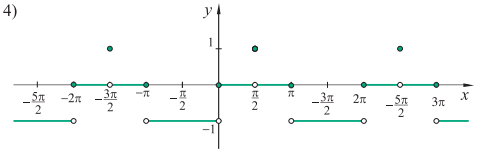


4) $\sin x \in [-1, 1]$;

$x = \dfrac{\pi}{2} + 2k\pi,\ k \in \mathbf{Z} \implies \lfloor \sin x \rfloor = 1$;

$x \in \left[2k\pi, \dfrac{\pi}{2} + 2k\pi\right\rangle \cup \left\langle \dfrac{\pi}{2} + 2k\pi, \pi + 2k\pi\right],\ k \in \mathbf{Z} \implies \lfloor \sin x \rfloor = 0$;

$x \in \langle \pi + 2k\pi, 2\pi + 2k\pi\rangle,\ k \in \mathbf{Z} \implies \lfloor \sin x \rfloor = -1$;



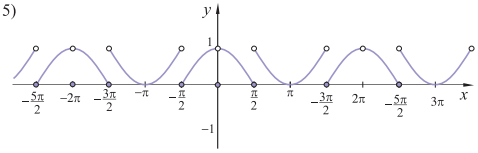
5) $f(x) = \cos x - \lfloor \cos x \rfloor$;

$x = 2k\pi,\ k \in \mathbf{Z} \implies \lfloor \cos x \rfloor = 1,\ f(x) = \cos x - 1 = 1 - 1 = 0$;

$x \in \left[-\dfrac{\pi}{2} + 2k\pi, 2k\pi\right\rangle \cup \left\langle 2k\pi, \dfrac{\pi}{2} + 2k\pi\right],\ k \in \mathbf{Z} \implies \lfloor \cos x \rfloor = 0,\ f(x) = \cos x$;

$x \in \left\langle \dfrac{\pi}{2} + 2k\pi, \dfrac{3\pi}{2} + 2k\pi\right\rangle,\ k \in \mathbf{Z} \implies \lfloor \cos x \rfloor = -1,\ f(x) = \cos x + 1$;

5)


y
1
−1
x
$-\frac{5\pi}{2}$
-2π
$-\frac{3\pi}{2}$
$-\pi$
$-\frac{\pi}{2}$
$\frac{\pi}{2}$
π
$\frac{3\pi}{2}$
2π
$\frac{5\pi}{2}$
3π