Zadatak 11. Odredi temeljni period svake od sljedećih funkcija:

1) $f(x) = \sin(3x+2)$;
2) $f(x) = \sin x \cos 3x$;
3) $f(x) = |\cos x|$;
4) $f(x) = \cos|x|$;
5) $f(x) = \sin x + \frac{1}{2}\sin 2x$;
6) $f(x) = \sin^2 x - \cos^2 x$.

Rješenje. **1)** $f(x) = \sin(3x+2)$

$$f(x+P) = \sin(3x+3P+2) = \sin(3x+2) = f(x), \quad 3P = 2\pi \implies P = \frac{2\pi}{3}.$$

2) $f(x) = \sin x \cos 3x = \frac{1}{2}[\sin(-2x) + \sin 4x] = \frac{1}{2}(\sin 4x - \sin 2x) = \frac{1}{2}\sin 4x - \frac{1}{2}\sin 2x$

$$P_1 = \frac{\pi}{2}, \quad P_2 = \pi \implies P = \pi.$$

3) $f(x) = |\cos x|, \quad P = \pi$.

4) $f(x) = \cos|x| = \cos x \implies P = 2\pi$.

5) $f(x) = \sin x + \frac{1}{2}\sin 2x$, $P_1 = 2\pi$, $P_2 = \pi \implies P = 2\pi$.

6) $f(x) = \sin^2 x - \cos^2 x = -\cos 2x \implies P = \pi$.