Zadatak 5. Deriviraj funkcije:

1) $f(x) = \sin 2x$;
2) $f(x) = \cos(2x+3)$;
3) $f(x) = \sin\sqrt{x}$;
4) $f(x) = \cos x^2$;
5) $f(x) = \cos\dfrac{1}{x}$;
6) $f(x) = \operatorname{tg}(\sqrt{x})$;
7) $f(x) = \operatorname{ctg}(x^2)$;
8) $f(x) = \sin(\cos x)$.

Rješenje.

1) $f'(x) = (\sin 2x)' = \cos 2x \cdot (2x)' = 2\cos 2x$;

2) $f'(x) = [\cos(2x+3)]' = -\sin(2x+3)\cdot(2x+3)' = -2\sin(2x+3)$;

3) $f'(x) = (\sin\sqrt{x})' = \cos\sqrt{x}\cdot(\sqrt{x})' = \dfrac{1}{2\sqrt{x}}\cos\sqrt{x}$;

4) $f'(x) = (\cos x^2)' = -\sin x^2 \cdot (x^2)' = -2x\sin x^2$;

5) $f'(x) = \left(\cos\dfrac{1}{x}\right)' = -\sin\dfrac{1}{x}\cdot\left(\dfrac{1}{x}\right)' = \dfrac{1}{x^2}\sin\dfrac{1}{x}$;

6) $f'(x) = [\operatorname{tg}(\sqrt{x})]' = \dfrac{1}{\cos^2(\sqrt{x})}\cdot(\sqrt{x})' = \dfrac{1}{\cos^2(\sqrt{x})}\cdot\dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}\cos^2(\sqrt{x})}$;

7) $f'(x) = [\operatorname{ctg}(x^2)]' = -\dfrac{1}{\sin^2(x^2)}\cdot(x^2)' = -\dfrac{2x}{\sin^2(x^2)}$;

8) $f'(x) = [\sin(\cos x)]' = \cos(\cos x)\cdot(\cos x)' = -\cos(\cos x)\cdot\sin x$.