# Antiderivative

## Homework

**№1.** Find antiderivatives of the following functions:

1. $f(x) = 5$;
2. $f(x) = x$;
3. $f(x) = x^6$;
4. $f(x) = 2^x$;
5. $f(x) = \dfrac{1}{x^7}$;
6. $f(x) = \sqrt{x}$;
7. $f(x) = \sqrt[5]{x}$;
8. $f(x) = x^{-5}$.

**№2.** For $f(x)$ find its antiderivative which passes through the specified point:

1. $f(x) = x^3, \quad A\left(1; \dfrac{5}{4}\right)$;
2. $f(x) = \cos x, \quad B\left(\dfrac{\pi}{6}; \dfrac{5}{2}\right)$;
3. $f(x) = 3^x, \quad C\left(2; \dfrac{9}{\ln 3}\right)$;
4. $f(x) = \dfrac{1}{\sin^2 x}, \quad D\left(\dfrac{\pi}{4}; 0\right)$;
5. $f(x) = \dfrac{1}{\sqrt{x}}, \quad E\,(16; 10)$;
6. $f(x) = \dfrac{1}{x}, \quad F\left(\dfrac{1}{e}; -2\right)$;
7. $f(x) = 2^x, \quad G\,(5; 1)$.

**№3.** Proove that both $F_1(x) = \dfrac{1}{2}\sin 2x$ and $F_2(x) = -\sin^2\left(x - \dfrac{\pi}{4}\right)$ are antiderivatives of $f(x) = \cos 2x$. What value of $C$ makes an equality $F_1(x) = F_2(x) + C$ true?

**№4.** A even function $f(x)$, defined on $\mathbb{R}$, has an antiderivative. Prove that among the antiderivatives of $\mathbb{R}$ there is an odd function.