Cvičení 11

Příklad 1. Vypočtěte (také jako určité integrály)

- $\int 5 \sin x \cos^5 x \, dx \qquad \left(\overset{c}{=} \frac{-5 \cos^6 x}{6} \quad \text{pro } x \in \mathbb{R} \right)$,
- $\int \frac{\ln^6 x}{x} \, dx \quad \left(\overset{c}{=} \frac{\ln^7 x}{7} \quad \text{pro } x \in (0, \infty) \right)$,
- $\int x \sqrt[5]{x^2+1} \, dx \qquad \left(\overset{c}{=} \frac{5 \sqrt[5]{(x^2+1)^6}}{12} \quad \text{pro } x \in \mathbb{R} \right)$,
- $\int \frac{\sin^4 x}{\cos^6 x} \, dx \qquad \left(\overset{c}{=} \frac{1}{5} \mathrm{tg}^5 x \quad \text{např. pro } x \in \left(-\frac{\pi}{2}, \frac{\pi}{2} \right) \right)$,
- $\int \frac{e^{2x}}{e^{2x}+1} \, dx \qquad \left(\overset{c}{=} \frac{\ln(e^{2x}+1)}{2} \quad \text{pro } x \in \mathbb{R} \right)$,
- $\int \frac{\sin x}{\cos x + 2} \, dx \qquad \left(\overset{c}{=} -\ln(\cos x + 2) \quad \text{pro } x \in \mathbb{R} \right)$,
- $\int \frac{\sin x - \cos x}{\sqrt{\sin x + \cos x}} \, dx$
  $\left(\overset{c}{=} -2\sqrt{\sin x + \cos x} \quad \text{pro } x \in \left(2k\pi - \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4} \right), \ k \in \mathbb{Z} \right)$,
- $\int \frac{5x+7}{x^2+2x+5} \, dx \qquad \left(\overset{c}{=} \frac{5}{2} \ln(x^2+2x+5) + \mathrm{arctg} \, \frac{x+1}{2} \quad \text{pro } x \in \mathbb{R} \right)$,
- $\int \frac{2x+1}{(x^2+1)^2} \, dx \qquad \left(\overset{c}{=} \frac{x-2}{2x^2+2} + \frac{1}{2} \mathrm{arctg} \, x \quad \text{pro } x \in \mathbb{R} \right)$,
- $\int \frac{8x-31}{x^2-9x+14} \, dx$
  $\left(\overset{c}{=} 3 \ln|x-2| + 5 \ln|x-7| \quad \text{v intervalu, který neobsahuje body } x = 2, \ x = 7 \right)$,
- $\int \frac{1}{x^3+1} \, dx$
  $\left(\overset{c}{=} \frac{1}{6} \ln \frac{(x+1)^2}{x^2-x+1} + \frac{\sqrt{3}}{3} \mathrm{arctg} \, \frac{2x-1}{\sqrt{3}} \quad \text{pro } x \in (-\infty, -1) \text{ nebo } x \in (-1, \infty) \right)$.