MATEMATRIX
LECȚII DE MATEMATICĂ PRÊT-À-PORTER

Primitive uzuale 1

1. Vom calcula $\int 2x^3 + \frac{1}{\sqrt[3]{x}} + \frac{1}{3x} dx, x \in (0,\infty)$.

$$\int 2x^3 + \frac{1}{\sqrt[3]{x}} + \frac{1}{3x} dx = 2\int x^3 dx + \int x^{-\frac{1}{3}} dx + \frac{1}{3}\int \frac{1}{x} dx = 2\frac{x^4}{4} + \frac{x^{\frac{2}{3}}}{\frac{2}{3}} + \frac{1}{3}\ln x + \mathscr{C}.$$

2. Calculăm $\int e^{\ln x} - 3^x + \frac{2}{x^3} dx, x \in (0,\infty)$.

$$\int e^{\ln x} - 3^x + \frac{2}{x^3} dx = \int e^{\ln x} dx - \int 3^x dx + \int \frac{2}{x^3} dx = \int x dx - \int 3^x dx + 2\int x^{-3} dx =$$

$$= \frac{x^2}{2} - \frac{3^x}{\ln 3} + 2\frac{x^{-2}}{-2} + \mathscr{C} = \frac{x^2}{2} - \frac{3^x}{\ln 3} - \frac{1}{x^2} + \mathscr{C}.$$

3. Să calculăm $\int \left((3x+2)^3 - \sqrt{2x+1} \right) dx, x \in (-\frac{1}{2}, \infty)$.

Vom folosi observația:

dacă $f : J \to \mathbb{R}$, J interval, este o funcție care admite primitive, iar F este o primitivă a sa, atunci $\int f(ax+b)dx = \frac{1}{a}F(ax+b) + \mathscr{C}, a \neq 0$.

$$\int \left((3x+2)^3 - \sqrt{2x+1} \right) dx = \int (3x+2)^3 dx - \int (2x+1)^{\frac{1}{2}} dx = \frac{1}{3}\frac{(3x+2)^4}{4} - \frac{1}{2}\frac{(2x+1)^{\frac{3}{2}}}{\frac{3}{2}} + \mathscr{C}$$