

Zad. 1.1. Oblicz

$$\int (ax^2+bx+c)dx, \int x^4(1+x)^3dx, \int (x+1)^3\sqrt{x}dx, \int \frac{(\sqrt{x}+1)^3}{x}dx, \int \frac{1}{ax+b}, \int \frac{1}{(ax+b)^2},$$

$$\int \frac{1}{x^2+a^2}, \int \frac{1}{ax^2+bx+c}, \int \sin^2 x dx, \int x^3 e^x dx, \int x^4 e^{2x} dx, \int x \cos x dx, \int x^2 \sin x dx,$$

$$\int x^3 \ln x, \int \sqrt{x} \ln x dx, \int x^n \ln x dx, \int \operatorname{arctg} x dx$$

Zad. 1.2. Całkując przez części, znajdź relacje rekurencyjne dla całek

$$\int \frac{dx}{(x^2 + \alpha^2)^n} = \frac{1}{\alpha^2} \left(\int \frac{dx}{(x^2 + \alpha^2)^{n-1}} - \int x \frac{x}{(x^2 + \alpha^2)^n} dx \right)$$

$$\int x^\alpha \ln^n x dx$$

$$\int x^n e^{\alpha x} dx$$

Zad. 1.3. Oblicz

$$\int x e^{3x^2} dx, \int x^2 \sin(x^3+1) dx, \int \frac{\ln x}{x} dx, \int \frac{1}{x \ln x} dx, \int \frac{\ln x}{x^3} dx, \int \sin x \cos^3 x dx, \int \sin^2 x \cos^3 x dx,$$

$$\int \frac{\cos x}{1+\sin x} dx, \int x^2 \sqrt{1+x} dx, \int \frac{dx}{1+\sqrt{x}}, \int \sqrt{1-x^2} dx, \int \sqrt{1+x^2} dx, \int \sqrt{x^2-1} dx,$$

$$\int \frac{1}{\sqrt{x^2+1}} dx, \int \frac{x^2}{\sqrt{1+x^2}} dx, \int \arcsin x$$

Zad. 1.4 Oblicz

$$\int \frac{dx}{2x^2+9x-5x}, \int \frac{dx}{x(2x^2+9x-5x)}, \int \frac{11x-1}{3x^2-5x-2} dx, \int \frac{9x-5}{9x^2-6x+1} dx, \int \frac{3x^3-5x^2+8x}{(x-1)^3(x+1)} dx, \int \frac{x^5+x^4+3x^3+x^2-2}{x^4-1} dx$$

Zad. 1.5. Oblicz

$$\int \frac{\cos x}{(1+\sin^2 x)^2} dx, \int \frac{\sin x}{(1+\sin^2 x)^2} dx, \int \frac{\cos x}{(1+\cos x)^2} dx, \int \frac{1}{1+e^x} dx, \int \frac{1}{1-e^x} dx, \int \frac{1}{e^{2x}+2e^x+2} dx,$$

$$\int \sqrt{1+e^x} dx$$

Zad. 1.6. Oblicz

$$\int \sqrt{\frac{x}{x+1}} dx, \int \sqrt[3]{\frac{x}{1-x}} dx, \int \frac{dx}{x\sqrt{x^2+4x-4}}, \int \frac{dx}{x-\sqrt{x^2-x+1}}, \int \frac{dx}{(2x-3)\sqrt{4x-x^2}}$$