

Zestaw 12 - całki

1. Obliczyć całki:

$$\begin{aligned}
 \text{a)} & \int (5x^2 - 6x + 3 - \frac{2}{x} + \frac{5}{x^2}) dx & \int \left(2x - 3x^2 + \frac{1}{2\sqrt{x}} \right) dx \\
 \text{b)} & \int (\sin x - \cos x) dx & \int \frac{x}{1+x^2} dx & \int \frac{x^2}{6+x^3} dx \\
 \text{c)} & \int (e^{3x} + e^{\frac{x}{3}}) dx & \int \operatorname{ctg}^2 x dx \\
 \text{d)} & \int \frac{dx}{\sin^2 x \cos^2 x} & \int \frac{\cos^2 x - \sin^2 x}{\sin^2 x \cos^2 x} dx \\
 \text{e)} & \int \frac{x\sqrt[3]{x} + \sqrt[4]{x}}{x^2} dx & \int \frac{\sqrt{x} - 2\sqrt[3]{x^2} + 4\sqrt[4]{5x^3}}{6\sqrt[3]{x}} dx & \int \frac{\sqrt[4]{x} - \sqrt[5]{x^3} + \sqrt{2x}}{\sqrt{x}} dx
 \end{aligned}$$

2. Obliczyć całki metodą przez podstawienie:

$$\begin{aligned}
 \text{a)} & \int (5x^3 - 3)^7 x^2 dx & \int (x^2 + 4)^5 x dx & \int \sin^3 x dx \\
 \text{b)} & \int \frac{x}{(x^2 + 3)^6} dx & \int \frac{x}{\sqrt{1-x^4}} dx & \int \frac{e^x}{e^{2x} + 1} dx \\
 \text{c)} & \int x e^{x^2} dx & \int \frac{\operatorname{tg} x}{(1 + \operatorname{tg}^4 x) \cos^2 x} dx & \int \frac{x^7}{\sqrt{1-x^{16}}} dx \\
 \text{d)} & \int \frac{\sin^3 x}{\cos^{10} x} dx & \int \frac{\ln x}{x} dx & \int \frac{\cos \sqrt{x}}{\sqrt{x}} dx \\
 \text{e)} & \int \sqrt{3x+1} dx & \int \frac{x}{\sqrt[3]{2x^2-1}} dx & \int \frac{x^2}{\cos^2(x^3+1)} dx \\
 \text{f)} & \int x\sqrt{1+x^2} dx & \int \frac{x^2}{\sqrt[5]{x^3+1}} dx & \int \frac{e^x}{2e^x+1} dx \\
 \text{g)} & \int \cos x e^{\sin x} dx & \int \frac{x^3}{\cos^2 x^4} dx & \int \frac{\cos x}{\sin^2 x + 4} dx \\
 \text{h)} & \int \frac{(\ln x)^2}{x} dx & \int \frac{1}{e^x + e^{-x}} dx & \int \sin^5 x \cos x dx \\
 \text{i)} & \int \frac{\operatorname{tg} x}{\cos^2 x} dx & \int \sin x \cos^2 x dx & \int \frac{dx}{x(1+\ln x)} & \int \frac{\cos x}{\sqrt{1+\sin x}} dx
 \end{aligned}$$

3. Obliczyć całki metodą całkowania przez części:

$$\begin{aligned}
 \text{a)} & \int x^2 e^x dx & \int x^3 e^x dx & \int x^4 e^{2x} dx & \int x^2 e^{-x} dx & \int x^3 e^{-x^2} dx \\
 \text{b)} & \int x^2 \cos x dx & \int x^2 \sin 5x dx & \int x \cos 3x dx & \int (4x+5) \sin 2x dx \\
 \text{c)} & \int e^x \cos x dx & \int e^{-2x} \sin 3x dx & \int e^x \cos \frac{2}{3} x dx \\
 \text{d)} & \int \sqrt{x} \ln x dx & \int (\ln x)^3 dx & \int \ln(x^2+1) dx & \int \frac{\ln x}{x^5} dx \\
 \text{e)} & \int \operatorname{arc} \operatorname{tg} x dx & \int \operatorname{arc} \sin x dx & \int \ln x dx
 \end{aligned}$$