

Całka oznaczona.

opracowanie: Agnieszka Görlich

1. Oblicz całki:

(a) $\int_0^\pi \sin x e^{\cos x} dx$

(b) $\int_1^{\sqrt{e}} \frac{dx}{x\sqrt{1-(\ln x)^2}}$

(c) $\int_0^{\frac{\pi}{2}} \sin^3 x dx$

(d) $\int_0^4 \frac{dx}{1+\sqrt{x}}$

(e) $\int_1^e x \ln x dx$

(f) $\int_0^{\ln 5} \frac{e^x \sqrt{e^x - 1}}{e^x + 3} dx$

(g) $\int_0^{\ln 2} \sqrt{e^x - 1} dx$

(h) $\int_0^1 \sqrt{4 - x^2} dx$

(i) $\int_0^1 x \sqrt{1 + x^2} dx$

(j) $\int_0^3 x \arctg x dx$

(k) $\int_0^3 \operatorname{sgn}(x - x^3) dx$

(l) $\int_{-1}^2 |x|^3 dx$

(m) $\int_1^e (1 + \ln x)^2 dx$

(n) $\int_0^{\frac{1}{2} \ln 3} \frac{e^x}{1+e^{2x}} dx$

(o) $\int_{-\pi}^\pi |\sin x + \frac{1}{2}| dx$

(p) $\int_0^1 \ln(1 + x^2) dx$

2. Znajdź średnią wartość funkcji w danym przedziale:

(a) $f(x) = \cos^2 x, x \in [0, \pi],$

(b) $f(x) = \frac{1}{\sqrt{4-x^2}}, x \in [0, 1]$

(c) $f(x) = e^x, x \in [-2, 2]$

(d) $f(x) = \frac{x}{\sqrt{1-x^2}}, x \in [0, \frac{\sqrt{2}}{2}].$

3. Oblicz:

(a) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} e^{2x} \cos x dx$

(b) $\int_{-\pi}^{\pi} \sin 2x \cos 3x dx$

(c) $\int_{-\frac{\pi}{5}}^{\frac{\pi}{5}} x \cos x dx$

(d) $\int_0^{2\pi} \sin^2 x dx$

(e) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} (x^4 \sin x) dx$

(f) $\int_0^{2\pi} \sin 2x dx$

(g) $\int_0^{\pi} \sin^4 x \cos^2 x dx$

(h) $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \operatorname{tg}^3 x dx$

(i) $\int_{-1}^1 x^2 dx$

(j) $\int_{-1}^1 (\sqrt[3]{(x+1)^2} \sqrt[3]{(x-1)^2}) \arcsin x dx$

(k) $\int_0^{2\pi} \cos^2 x dx$

(l) $\int_{-100}^{100} x^5 \cos^4 x dx$

(m) $\int_{\frac{\pi}{19}}^{\frac{39\pi}{19}} \sin x dx$