

Per partes

- (i) $\int x \sin x \, dx$
(ii) $\int \ln x \, dx$
(iii) $\int x \operatorname{arctg} x \, dx$
(iv) $\int 2e^x \cos x \, dx$
(v) $\int_0^\pi (4x - 1) \cos(2x) \, dx$
(vi) $\int_{-\pi}^\pi \cos^2 x \, dx$

Substituce

- (vii) $\int \sin(4x - 1) \, dx$
(viii) $\int \frac{\sqrt{1 + \ln x}}{x} \, dx$
(ix) $\int \frac{x}{\sqrt{1 - 4x^2}} \, dx$
(x) $\int x \sin^3 x \cos x \, dx$
(xi) $\int_e^{e^2} \frac{1}{x \ln^3 x} \, dx$
(xii) $\int_0^1 3x \sqrt{1 + x^2} \, dx$

Výsledky:

- (i) $\sin x - x \cos x$, $x \in \mathbb{R}$; (ii) $x(\ln x - 1)$, $x \in (0, +\infty)$; (iii) $\frac{1}{2}((x^2 + 1)\operatorname{arctg} x - x)$, $x \in \mathbb{R}$;
(iv) $e^x(\sin x + \cos x)$, $x \in \mathbb{R}$; (v) 0; (vi) π , (vii) $-\frac{1}{4} \cos(4x - 1)$, $x \in \mathbb{R}$;
(viii) $\frac{2}{3} \sqrt{(1 + \ln x)^3}$, $x \in [e^{-1}, +\infty)$; (ix) $-\frac{1}{4} \sqrt{1 - 4x^2}$, $x \in \left(-\frac{1}{2}, \frac{1}{2}\right)$; (x) $\frac{1}{4} \sin^4 x$, $x \in \mathbb{R}$;
(xi) $\frac{3}{8}$; (xii) $2\sqrt{2} - 1$