

Substitute vs Per partes ;-)

- | | |
|---|---|
| (i) $\int_{-1}^0 x^3 e^{-x} dx$ | (xi) $\int_{-\pi}^{\pi} \sin^3 x dx$ |
| (ii) $\int \arcsin x dx$ | (xii) $\int \frac{\ln x - 2}{x\sqrt{\ln x}} dx$ |
| (iii) $\int 6x^2 \sqrt{1+x^3} dx$ | (xiii) $\int \frac{3x^2}{\cos^2(x^3+1)} dx$ |
| (iv) $\int_{-4}^0 (x - x+2) dx$ | (xiv) $\int_{-1}^0 \frac{x}{e^x} dx$ |
| (v) $\int (3x+1)e^{3x} dx$ | (xv) $\int_0^1 \sqrt{2^{2x}} dx$ |
| (vi) $\int \frac{x}{\sin^2 x} dx$ | (xvi) $\int \frac{e^x}{e^x + 2} dx$ |
| (viii) $\int (x^2 + 4x - 5) \cos x dx$ | (xvii) $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$ |
| (vii) $\int_1^e \frac{\ln x}{x^2} dx$ | (xviii) $\int_0^1 \frac{dx}{e^x + e^{-x}}$ |
| (ix) $\int_{-1}^1 x dx, \quad \int_{-1}^1 x^2 dx$ | (xix) $\int \frac{\sqrt{x}}{x(x+1)} dx$ |
| (x) $\int_0^{\pi} x^2 \cos x dx$ | (xx) $\int_{-\frac{1}{2}}^0 \frac{\sqrt{1+x}}{\sqrt{1-x^2}} dx$ |

Výsledky: ($C \in \mathbb{R}$ níže je integrační konstanta)

- (i) $2e - 6$; (ii) $x \arcsin x + \sqrt{1-x^2} + C, x \in (-1, 1)$; (iii) $\frac{4}{3} \sqrt{(1+x^3)^3} + C, x \in [-1, +\infty)$;
 (iv) -12 ; (v) $xe^{3x} + C, x \in \mathbb{R}$; (vi) $-x \cot g x + \ln |\sin x| + C, x \in (k\pi, (k+1)\pi), k \in \mathbb{Z}$;
 (vii) $\frac{e-2}{e}$; (viii) $(x^2 + 4x - 7) \sin x + (2x + 4) \cos x + C, x \in \mathbb{R}$; (ix) $0, \frac{2}{3}$; (x) -2π ; (xi) 0 ;
 (xii) $2\sqrt{\ln x} \left(\frac{1}{3} \ln x - 2 \right) + C, x \in (1, +\infty)$; (xiii) $\operatorname{tg}(x^3 + 1) + C$,
 $x \in \left(\sqrt[3]{-\frac{\pi}{2} - 1 + k\pi}, \sqrt[3]{\frac{\pi}{2} - 1 + k\pi} \right), k \in \mathbb{Z}$; (xiv) -1 ; (xv) $\frac{1}{\ln 2}$; (xvi) $\ln(e^x + 2) + C$,
 $x \in \mathbb{R}$; (xvii) $2e^{\sqrt{x}} + C, x \in (0, +\infty)$; (xviii) $\operatorname{arctg} e - \frac{\pi}{4}$; (xix) $2 \operatorname{arctg} \sqrt{x} + C, x \in (0, +\infty)$;
 (xx) $-2 + \sqrt{6}$