Určitý ∫ → Newtonův

$$\int_{-1}^{2} 2x\,dx = \left[x^2\right]_{-1}^{2} = 2^2 - (-1)^2 = 3$$

$$\int_{0}^{1} \frac{1}{\sqrt{1-x^2}}\,dx = \left[\arcsin x\right]_0^1 = \frac{\pi}{2} - 0 = \frac{\pi}{2}$$

Problémy

$$\int_1^\infty \frac{1}{x} = \left[\log x\right]_1^\infty = \infty - 0 = \infty \qquad \text{diverguje}$$

$$\int_0^\infty -\sin x = \left[\cos x\right]_0^\infty = \underbrace{\lim_{x\to\infty} \cos x}_{\nexists} - \lim_{x\to 0} \cos x = ? \qquad \int \nexists$$

$$\int_{-\infty}^{\infty} x = \left[\frac{x^2}{2}\right]_{-\infty}^{\infty} = \infty - \infty \; ? \qquad \int \nexists$$

$$\int_{-3}^{3} \frac{1}{x^2} \neq \Big[\underbrace{-\frac{1}{x}}_{\nexists \text{ na } (-3,3)}\Big]_{-3}^{3} = -\frac{1}{3} - \frac{-1}{-3} = 0$$

Per partes

$$\int_0^1 x e^x\,dx = \left[x e^x\right]_0^1 - \int_0^1 e^x\,dx = \left[x e^x\right]_0^1 - \left[e^x\right]_0^1 = e - 0e^0 - (e^1 - e^0) = 1$$

$u = x \quad v' = e^x$

$u' = 1 \quad v = e^x$

Substituce

$$\int_0^2 \frac{-1}{2\sqrt{4-x^2}} \cdot (-2x)\,dx = \int_4^0 \frac{-1}{2\sqrt{y}}\,dy = \left[\sqrt{y}\right]_0^4 = 2 - 0 = 2$$

$y = 4 - x^2$

$dy = -2x\,dx$

x	0	2
$y = 4-x^2$	4	0

$(\alpha, \beta) = (0, 2)$

$(a, b) = (0, 4)$

$\varphi((0,2)) = (0,4)$

Subst. 1. pF.

$$\int_{-1/2}^{2} \frac{2}{2} \cdot (2x+1)\,dx = \int_0^5 \frac{1}{2} y \, dy = \left[\frac{y^2}{4}\right]_0^5 = \frac{25}{4}$$

$y = 2x+1$

$dy = 2dx$

x	$-1/2$	2
y	0	5