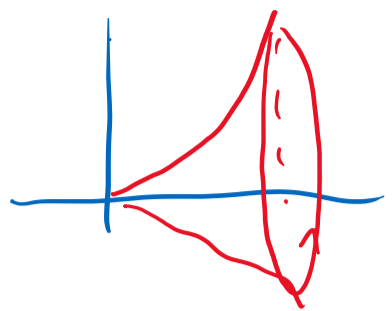


Príkled

$$y = x^2$$

$$V = \pi \int_0^1 (x^2)^2 dx = \pi \frac{x^5}{5} \Big|_0^1 = \frac{\pi}{5}$$



## PRAKTICKÝ VÝPOČET

Newton - Leibniz

$$\int_a^b f(x) dx$$

7.1. → U.I

f(x,y) 9-11x

8t

12t

Pr.  $\int_0^{\pi/2} x \sin x dx = \text{PF} \int_0^{\pi/2} = -x \cos x + \sin x \Big|_0^{\pi/2} = 1$

13t

PF májden božomv

nóby PF  $\int x \sin x dx = \left. \begin{array}{l} u = x \\ u' = 1 \end{array} \right\} \left. \begin{array}{l} v = \sin x \\ v' = \cos x \end{array} \right\} = -x \cos x + \int \cos x dx = -x \cos x + \sin x + C$  ✓

ODPORUČANÝ POSTUP

POUŽITÍ PP na U.I

$\int_0^{\pi/2} x \sin x dx = \left. \begin{array}{l} = -x \cos x \Big|_0^{\pi/2} + \int_0^{\pi/2} \cos x dx = 1 \end{array} \right\}$  Zod of

$$\int_a^b u(x)v(x) dx = u(x)v(x) \Big|_a^b - \int_a^b u'(x)v(x) dx$$

Substitúcia

$$\int_0^2 x^2 \sin(x^3) dx = \text{PF} \Big|_0^2 = -\frac{\cos(x^3)}{3} \Big|_0^2 =$$

$$\text{PF} = \frac{1}{3} \int 3x^2 \sin(x^3) dx = \left. \begin{array}{l} x^3 = t \\ 3x^2 dx = dt \end{array} \right\} = \frac{1}{3} \int \sin t dt = -\frac{\cos t}{3} = -\frac{\cos(x^3)}{3}$$

ODPORUČANÝ POSTUP

SUBST. a U.I

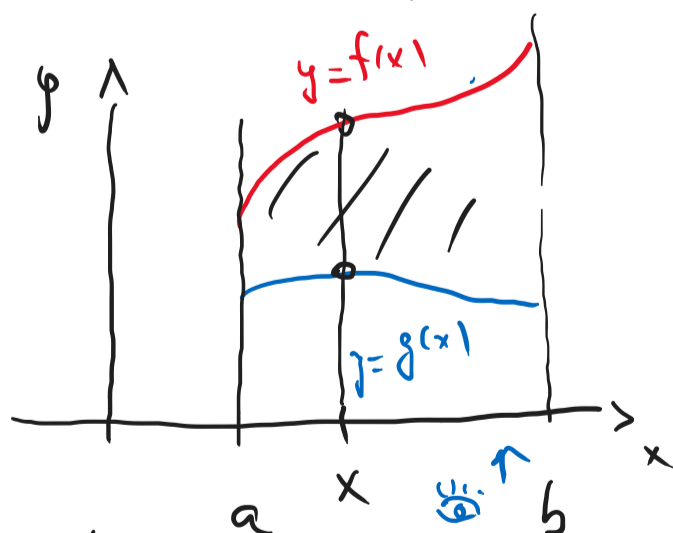
$\frac{1}{3} \int_0^2 3x^2 \sin(x^3) dx = \left. \begin{array}{l} x^3 = t \\ 3x^2 dx = dt \\ \text{zmena hraníc} \\ \text{ak } x=0 \Rightarrow t=0 \\ x=2 \Rightarrow t=8 \end{array} \right\} = \frac{1}{3} \int_0^8 \sin t dt = -\frac{\cos t}{3} \Big|_0^8$

Veľa a subst.

nech  $\varphi$  je spoj. na  $\langle a, b \rangle$ ,  $f$  je spoj. na  $\langle \varphi(a), \varphi(b) \rangle$  Pok.

$$\int_a^b f(\varphi(x)) \varphi'(x) dx = \left. \begin{array}{l} \varphi(x) = t \\ \varphi'(x) dx = dt \\ x=a \Rightarrow t=\varphi(a) \\ x=b \Rightarrow t=\varphi(b) \end{array} \right\} = \int_{\varphi(a)}^{\varphi(b)} f(t) dt$$

Plocha pramoce U.I.

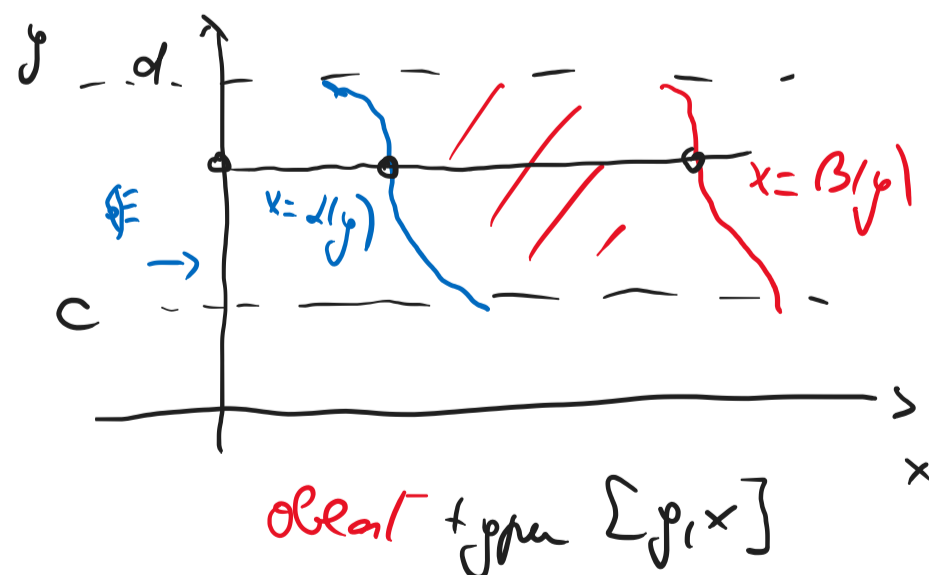


$$P = \int_a^b f(x) - g(x) dx$$

oblast je el. oblasiť  $[x, y]$

$$a \leq x \leq b$$

$$g(x) \leq y \leq f(x)$$



$$P = \int_c^d B(y) - d(y) dy$$

$$c \leq y \leq d$$

$$d(y) \leq x \leq B(y)$$