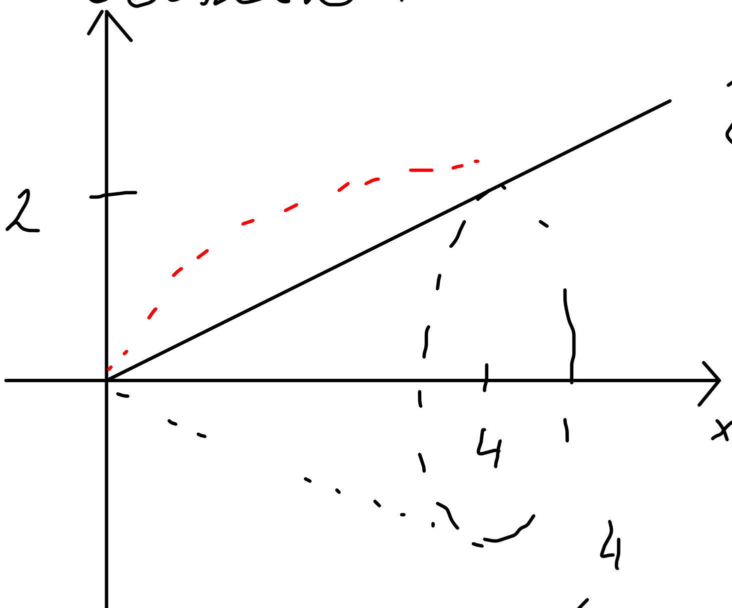
Konzultáció P0 2023.12.19.

Felszín :



$y = \frac{x}{2} \quad x \in [0,4]$

Felszín :

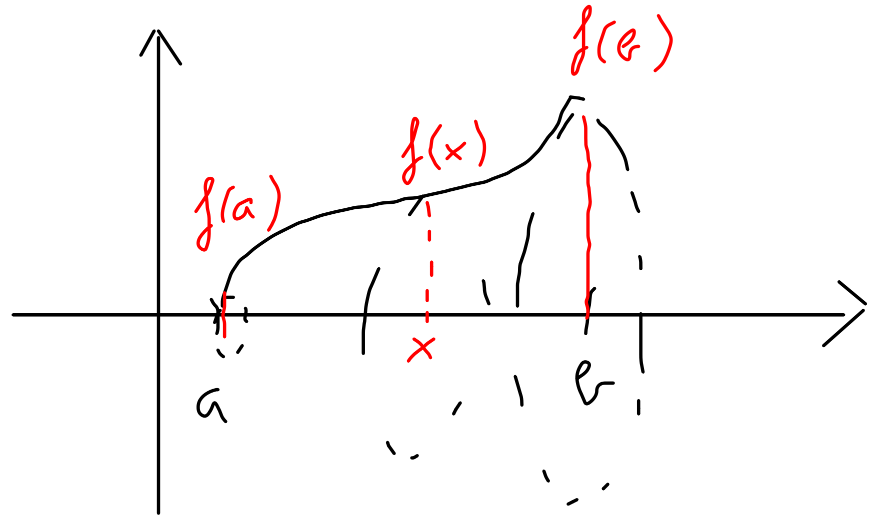
$$F = 2\pi \cdot \int_0^4 f(x) \cdot \sqrt{1+(f'(x))^2}\, dx$$

$$= 2\pi \cdot \int_0^4 \frac{x}{2} \cdot \sqrt{1+\frac{1}{4}}\, dx = \cancel{2}\pi \cdot \int_0^4 \frac{1}{\cancel{2}} \cdot \frac{\sqrt{5}}{2} \cdot x\, dx =$$

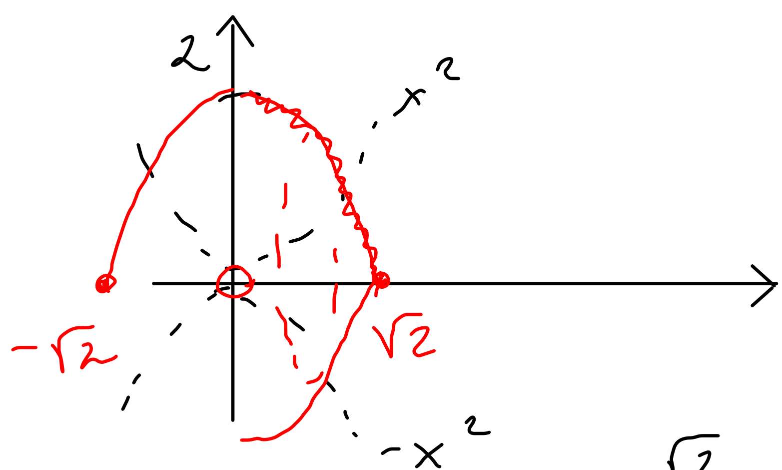
$f(x) = \frac{x}{2} \quad f'(x) = \frac{1}{2} \quad (f')^2 = \frac{1}{4}$

$$= \pi \frac{\sqrt{5}}{2} \int_0^4 x\, dx = \pi \cdot \frac{\sqrt{5}}{2} \cdot \left[\frac{x^2}{2}\right]_0^4 = \pi \frac{\sqrt{5}}{\cancel{2}} \frac{\cancel{16}^{4}}{\cancel{2}} = 4\sqrt{5}\pi$$

Térfogat



$$V = \pi \cdot \int_a^b f^2(x)\,dx$$



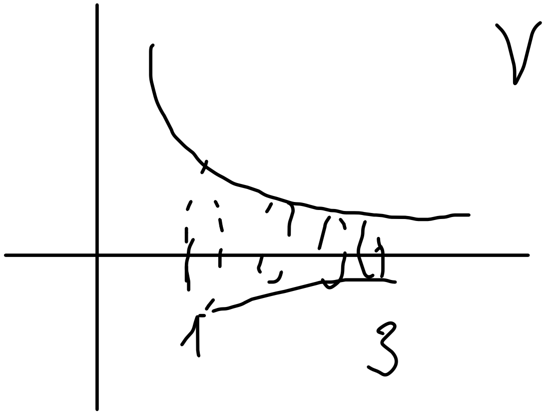
$$\left.\begin{array}{l} f(x) = -x^2+2 \\ x \in [0, \sqrt{2}] \end{array}\right\} \qquad \begin{array}{r} -x^2+2 = 0 \\ 2 = x^2 \\ \pm\sqrt{2} = x \end{array}$$

$$V = \pi \cdot \int_0^{\sqrt{2}} (-x^2+2)^2\,dx =$$

$$= \pi \cdot \int_0^{\sqrt{2}} x^4 - 4x^2 + 4\,dx = \pi \cdot \left[\frac{x^5}{5} - 4\frac{x^3}{3} + 4x\right]_0^{\sqrt{2}} =$$

$$= \pi \cdot \left(\left(\frac{4\sqrt{2}}{5} - \frac{8\sqrt{2}}{3} + 4\sqrt{2}\right) - 0\right) = \pi \cdot \frac{32\sqrt{2}}{15}$$

$$f(x) = \frac{1}{x} \quad x \in [1, 3]$$



$$V = \pi \int_1^3 \left(\frac{1}{x}\right)^2 dx = \pi \cdot \int_1^3 \frac{1}{x} \, dx =$$

$$= \pi \int_1^3 x^{-2} dx = \pi \left[\frac{x^{-1}}{-1} \right]_1^3 =$$

$$= \pi \cdot \left[-\frac{1}{x} \right]_1^3 = \pi \cdot \left(-\frac{1}{3} - \left(-\frac{1}{1} \right) \right) =$$

$$= \pi \cdot \frac{2}{3}$$

$\exists\, P \in \mathbb{R}^+$ amire $f(x) = f(x + k \cdot P)$ $k \in \mathbb{Z}$

sin, cos, tg, ctg, $\{x\}$

↳ ebből állítottuk elő f-et

$$\sin(\underbrace{2x}_{\tilde{x}}) = \sin(\tilde{x} + 2\pi) = \sin(2x + 2\pi) =$$

$$= \sin(2(x+\pi))$$

Ha $x_0 \in D_f$-ben $f(x_0) = 0$ és semilyen P-re

$$f(x_0 + P) \neq 0$$