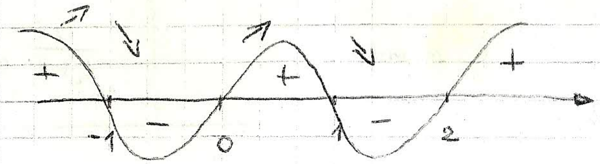
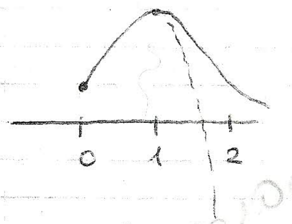


$f''(0) = -2$

$f''(1) = \frac{1}{2}$

$f''(2) = \frac{22}{125}$



$$M = \max_{x \in \langle 0,2 \rangle} |f''(x)| = |-2| = 2$$

$$E > \frac{(b-a)^3}{12n^2} \cdot M$$

$$\frac{1}{10} > \frac{(2-0)^3}{12n^2} \cdot 2$$

$$\frac{1}{10} > \frac{\cancel{16}^{\,4}}{{}_3\cancel{12}n^2}$$

$$10 < \frac{3}{4} n^2$$

$$n^2 > \frac{40}{3}$$

$$n > \sqrt{\frac{40}{3}}$$

$$n > 3{,}65\ldots$$

Przyjmijmy $n = 4$

$$h = \frac{2-0}{4} = \frac{1}{2}$$

i	0	1	2	3	4
x	0	$\frac{1}{2}$	1	$3/2$	2
y	1	$\frac{4}{5}$	$1/2$	$4/13$	$\frac{1}{5}$

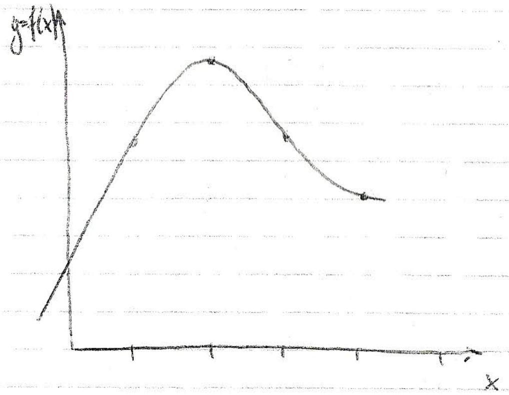
← wstawiamy do wzoru

$$\int_0^2 \frac{1}{x^2+1}\,dx \approx \frac{\frac{1}{2}}{2}\left[1 + \frac{1}{5} + 2\left(\frac{4}{5} + \frac{1}{2} + \frac{4}{13}\right)\right] = \ldots \approx 1{,}1038$$

$$\int_0^2 \frac{1}{x^2+1} = \operatorname{arctg}(x)\Big|_0^2 = \operatorname{arctg}(2) - \operatorname{arctg}(0) = 1{,}1071$$

Rozwiązywanie równań różniczkowych

$$y' = \frac{dy}{dx} = \lim_{\Delta x \to 0} \frac{f(x+\Delta x) - f(x)}{x + \Delta x - x}$$



$$\lim_{x_{i+1} \to x_i} \frac{y_{i+1} - y_i}{x_{i+1} - x_i}$$