Fourier-sorok

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1.

Alábbiakban $\omega_0 = 0$
Triangle

$$\begin{aligned} y(t) &= \frac{8}{\pi^2}\sum_{k=0}^{\infty}(-1)^k \frac{\sin\left((2k+1)t\right)}{(2k+1)^2} \\ &= \frac{8}{\pi^2}\left(\sin(t) - \frac{1}{9}\sin(3t) + \frac{1}{25}\sin(5t) - \cdots\right) \end{aligned}$$

$$\begin{aligned} y(t) =& \frac{2}{\pi}\sum_{k=1}^{\infty}(-1)^k \cdot \frac{\sin(kt)}{k} \\ y(t) =& \frac{1}{2} - \frac{1}{\pi}\sum_{k=1}^{\infty}\frac{\sin(kt)}{k} \end{aligned}$$

2. Programmal előállított

$$y(t) = \sum_{k=0}^{15} k \cdot \frac{\sin(kt)}{(k+1)^2} \tag{1}$$

$$y(t) = \sum_{k=0}^{15} k \cdot \frac{\sin(kt)}{(k+1)^3} \tag{2}$$

$$y(t) = \sum_{k=0}^{15} k \cdot \frac{\sin(kt)}{(k+1)^4} \tag{3}$$

$$y(t) = \sum_{k=0}^{15} (k-1) \cdot \frac{\sin(kt)}{(k+1)^2} \tag{4}$$

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$$y(t) = \sum_{k=0}^{15} (k-1) \cdot \frac{\sin(kt)}{(k+1)^4} \tag{6}$$

$$y(t) = \sum_{k=0}^{15} (-1)^k \cdot \frac{\sin(kt)}{(2k+1)^2} \tag{7}$$

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$$y(t) = \sum_{k=0}^{15} (-1)^k \cdot \frac{\sin(kt)}{(2k+1)^4} \tag{9}$$

$$x \in [-20, 20] \tag{10}$$

$$y(t) = \sum_{k=0}^{15} k \cdot \frac{\cos(kt)}{(k+1)^2} \tag{11}$$

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$$y(t) = \sum_{k=0}^{15} (-1)^k \cdot \frac{\cos(kt)}{(2k+1)^2} \tag{17}$$

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$$y(t) = \sum_{k=0}^{15} (-1)^k \cdot \frac{\cos(kt)}{(2k+1)^4} \tag{19}$$

$$x \in [-20, 20] \tag{20}$$

$$y(t) = \sum_{k=0}^{15} k \cdot \frac{x^k}{(k+1)^2} \tag{21}$$

$$y(t) = \sum_{k=0}^{15} k \cdot \frac{x^k}{(k+1)^3} \tag{22}$$

$$y(t) = \sum_{k=0}^{15} k \cdot \frac{x^k}{(k+1)^4} \tag{23}$$

$$y(t) = \sum_{k=0}^{15} (k-1) \cdot \frac{x^k}{(k+1)^2} \tag{24}$$

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$$y(t) = \sum_{k=0}^{15} (k-1) \cdot \frac{x^k}{(k+1)^4} \tag{26}$$

$$y(t) = \sum_{k=0}^{15} (-1)^k \cdot \frac{x^k}{(2k+1)^2} \tag{27}$$

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$$x \in [-2, 2] \tag{30}$$

3. Ábrázolandó függvények

$$y(x) = 2x \cos x, \qquad x \in [-50, 50] \tag{31}$$

$$y(x) = 5sin^5(3x), \qquad x \in [-2\pi, 2pi] \tag{32}$$

$$y(x) = 5sin^2(3x), \qquad x \in [-2\pi, 2pi] \tag{33}$$

$$y(x) = \sin(3x)\cos(2,9x), \qquad x \in [0, 150] \tag{34}$$

$$y(x) = \sin(3x) + \cos(2,9x), \qquad x \in [0, 150] \tag{35}$$

$$y(x) = \frac{\sin x}{x}, \qquad x \in [-50, 50] \tag{36}$$

$$y(x) = \left(1 + \frac{5}{x}\right)^x, \qquad x \in [1, 50] \tag{37}$$

$$\tag{38}$$