Defining a program Mathcad

Goal: To get programming skills of user tasks by MathCAD

Content

1. According to the option of the task (Table 1), construct a graph the functions f(x) and f '(x) in the same axis for a given range of the argument [a, b]. Graphs should contain numerical axes, grid lines, chart signature.

2. Calculate the sum of the function values f(x) on the nodes grid definition
   Δ: $a=x_0 < x_1 < \ldots < x_i < \ldots < x_n=b$
   $x_i=a + i \cdot h$
   using loop operator WHILE.

3. Calculate the sum of the function values f(x) on the nodes grid definition
   Δ: $a=x_0 < x_1 < \ldots < x_i < \ldots < x_n=b$
   $x_i=a + i \cdot h$
   using loop operator FOR.

4. * Вычислить сумму значений функции $f(x)$ на сетке узлов
   Δ: $a=x_0 < x_1 < \ldots < x_i < \ldots < x_n=b$
   $x_i=a + i \cdot h$
   using loop operator IF and Recursion.

5. * Given an array elements $\{y_i\}$ i=1..n. Create a program that changes the maximum and minimum element.

Таблица 1

№/№	f(x)	[a,b]	h
1	$\sqrt{x^2+5\cdot 2x+\sqrt{x^2+0{,}5}}$	[1 , 5]	0,5
2	$\frac{\sin(2x+0{,}5)}{2+\cos(x^2+1)}$	[0 , π]	$\frac{\pi}{10}$
3	$\log_5(x-10)-2-\log_5 2$	[11 , 16]	0,5
4	$\frac{1+0{,}5x}{1+\sqrt{0{,}8x^2+1{,}4}}$	[2 , 8]	0,6
5	$\frac{\sqrt{0{,}5x+2}}{\sqrt{2x^2+1}+0{,}8}$	[0 , 15]	1,5
6	$\frac{\cos(0{,}8x+1{,}2)}{1{,}5+\sin(x^2+0{,}6)}$	[π , 2π]	$\frac{\pi}{10}$
7	$\log_3(x(x+3)-\log_3\frac{x+3}{x}-2$	[11 , 16]	0,5
8	$\log_9 5-\frac{\log_{0{,}5}(5-2x)}{\log_2 9}$	[1 , 2.5]	0,1
9	$\frac{\sqrt{0{,}8x^2+1}}{x+\sqrt{1{,}5x^2+2}}$	[-20,-15]	0,5
10	$\frac{\sin(x+1{,}4)}{0{,}8+\cos(2x^2+0{,}5)}$	[0 , 1]	0,1
11	$\log_7\frac{x+3}{3x-1}-\log_{1/7}\frac{1}{2}$	[1 , 11]	1
12	$\sqrt{2x^2+1{,}6}\cdot 2x+\sqrt{0{,}5x^2+3}$	[-10 , -1]	0,6
13	$\frac{\sin(0{,}5x+0{,}4)}{1{,}2+\cos(x^2+0{,}4)}$	[-π , 0	$\frac{\pi}{8}$
14	$\log_2(5x-3)-3\log_2\sqrt[3]{x-1}-1$	[1 , 4]	0,4
15	$\frac{24}{x^2+2x-8}-\frac{15}{x^2+2x-3-}-2$	[-20,-10]	1
16	$\mathrm{tg}(0{,}5x+0{,}1)-x^2$	[-3 , 0]	0,3
17	$\frac{\cos(0{,}4x^2+1)}{2{,}3+\sin(1{,}5x+0{,}3)}$	[0 , π]	$\frac{\pi}{10}$
18	$ctgx-0{,}1x$	[1 , 2]	0,05
19	$2\log_{0{,}5}x-0{,}1\cdot x+1$	[1 , 11]	1
20	$\mathrm{ctg}1{,}05x-x^2$	[-π , 0]	$\frac{\pi}{10}$