O‘ZBEKISTON RESPUBLIKACI OLIY VA O‘RTA MAXSUS TA’LIM VAZIRLIGI

MUHAMMAD AL-XORAZMIY NOMIDAGI TOSHKENT AXBOROT TEXNOLOGIYALARI UNIVERSITETI NURAFSHON FILIALI

“Kompyuter injiniringi” fakulteti

Amaliy topshiriq

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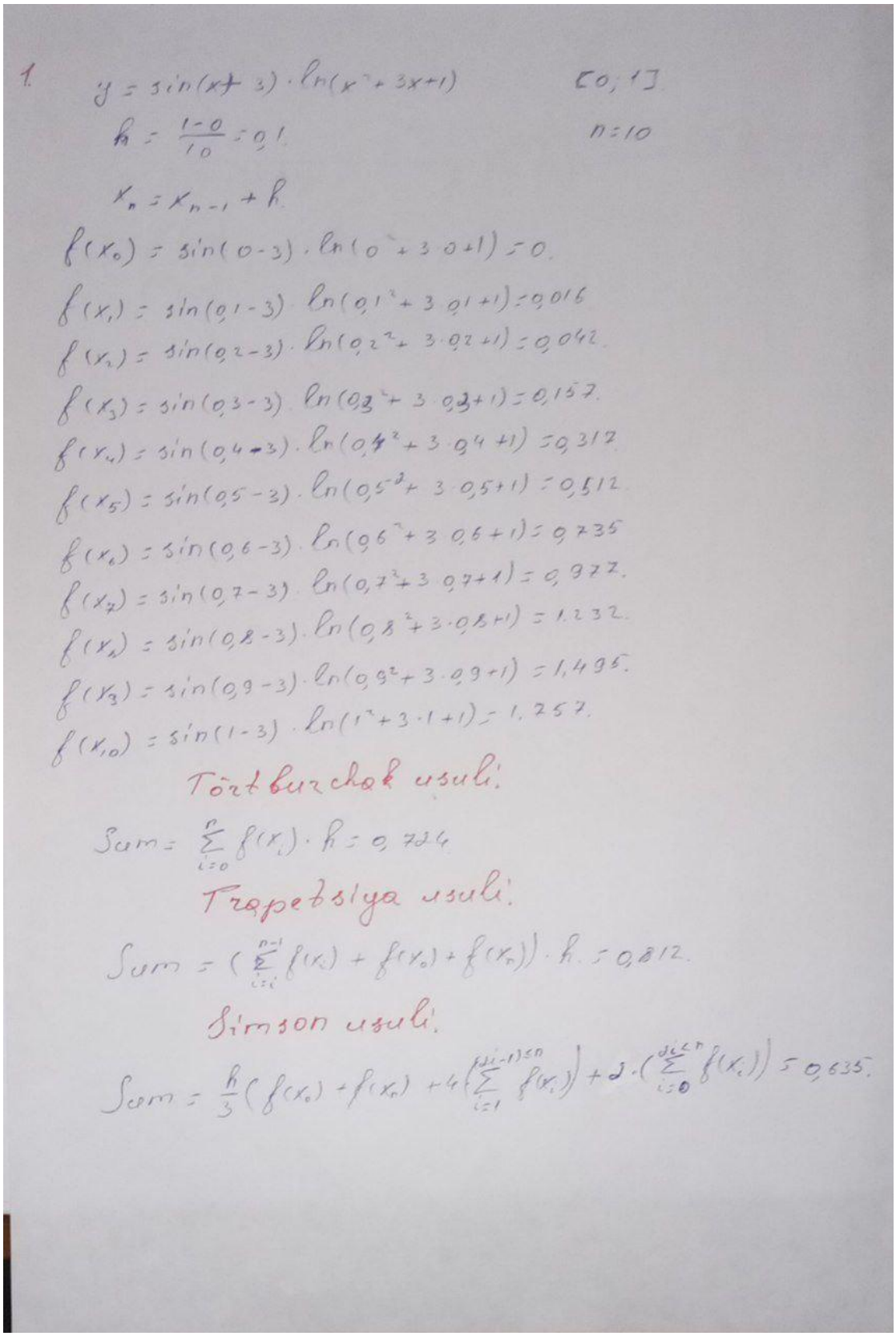
guruh raqami: 710-21

Dastur: https://algoritm-amaliyot.netlify.app

Dastur kodi: https://github.com/Ulugbek-Akmalovich-Shodimurodov/Algaritm_amaliyot



2. Misol. Nyuton usuli.

2.1. $f(x) = x^3 + 2x + 1 = 0$ oraliq $(-1; 0)$

$f'(x) = 3x^2 + 2 = 0$ $\quad \varepsilon = 0{,}0001$

$$x_1 = -1 - \frac{f(x)}{f'(x)} = -1 - \frac{-1 - 2 + 1}{3 + 2} = -1 + 0{,}4 = -0{,}6$$

$$x_2 = -0{,}6 - \frac{f(-0{,}6)}{f'(-0{,}6)} = -0{,}6 - \frac{-0{,}216 - 1{,}2 + 1}{1{,}08 + 2} = -0{,}6 + \frac{0{,}416}{3{,}08} = -0{,}4649$$

$$x_3 = -0{,}4649 - \frac{f(-0{,}4649)}{f'(-0{,}4649)} = -0{,}4649 + \frac{0{,}0303}{2{,}6483} = -0{,}4534$$

$$x_4 = -0{,}4534 - \frac{f(-0{,}4534)}{f'(-0{,}4534)} = -0{,}4534 - \frac{-0{,}000006}{2{,}6167} = \boxed{-0{,}4534}$$

Vatar usuli.

2.2. $f(x) = x\sqrt{x+2} - 3 = 0$. oraliq $(1; 2)$ (a b)

$y = f(a)$

$$\begin{cases} \dfrac{x - a}{b - a} = \dfrac{y - f(a)}{f(b) - f(a)} \\ y = 0 \end{cases}$$

$$x - a = -\frac{f(a)}{f(b) - f(a)}(b - a)$$

$$x = a - \frac{f(a)}{f(b) - f(a)} \cdot (b - a)$$

$$x_n = x_{n-1} - \frac{f(x_{n-1})}{f(b) - f(x_{n-1})} \cdot (b - x_{n-1})$$

$$x_1 = 1 - \frac{f(1)}{f(2) - f(1)} = 1 - \frac{1{,}7320 - 3}{4 - 3 - (1{,}7320 - 3)} = 1 + \frac{1{,}2679}{2{,}2679} = 1{,}55906$$

$$x_2 = 1{,}55906 - \frac{f(1{,}55906)}{1 - f(1{,}55906)} = 1{,}55906 + \frac{0{,}05875}{0{,}94124} = 1{,}62147.$$

$$x_3 = 1,62147 - \frac{f(1,62147)}{1 - f(1,62147)} = 1,62147 - \frac{0,01563}{0,9431} = 1,52775$$