

Аналітичні розрахунки

x_1	2,4	2,6	2,8	3	3,2	3,4
y_1	3,526	3,582	3,645	3,709	3,784	3,858
Δy_1	0,256	0,168	0,088	0,067	0,051	
$\Delta^2 y_1$	-0,083	-0,065	-0,044	-0,01		
$\Delta^3 y_1$	0,028	0,028	0,028			
$\Delta^4 y_1$	0	-0,007				
$\Delta^5 y_1$	-0,007					

$x = 2,4$ $h = 0,2$
 $y'(2,4) \approx \frac{1}{0,2} (0,168 - \frac{-0,065}{2} + \frac{0,028}{3} - \frac{-0,007}{4}) =$
 $= (0,168 + 0,0325 + 0,0093 + 0,00025) = 0,20985$
 $y''(2,4) \approx \frac{1}{0,2^2} (-0,065 - 0,028 + \frac{11}{12} \cdot (-0,01)) =$
 $= 2,5 (-0,043 - 0,00083) = -2,148$

Код

```

import numpy as np
import math

mas_x = [2.4, 2.6, 2.8, 3.0, 3.2, 3.4]
mas_y = [3.526, 3.782, 3.945, 4.043, 4.182, 4.155]
h = mas_x[1] - mas_x[0]
print(h)

mas_1 = []
mas_2 = []
mas_3 = []
mas_4 = []

for i in range(len(mas_y)):
    mas_1.append(mas_y[i] - mas_y[i - 1])
    mas_1.pop(0)
    print("mas_1 = ", mas_1)

for j in range(len(mas_1)):
    mas_2.append(mas_1[j] - mas_1[j - 1])
    mas_2.pop(0)
    print("mas_2 = ", mas_2)

for k in range(len(mas_2)):
    mas_3.append(mas_2[k] - mas_2[k - 1])
    mas_3.pop(0)
    print("mas_3 = ", mas_3)

for l in range(len(mas_3)):
    mas_4.append(mas_3[l] - mas_3[l - 1])
    mas_4.pop(0)
    print("mas_4 = ", mas_4)

```

88 % Проблемы не найдены.

```

C:\WINDOWS\system32\cmd.exe
0.200000000000000018
mas_1 = [0.25600000000000002, 0.16799999999999998, 0.09800000000000003, 0.059000000000000016, 0.052999999999999936]
mas_2 = [-0.093000000000000042, -0.06499999999999995, -0.0390000000000000146, -0.0060000000000000227]
mas_3 = [0.028000000000000013, 0.0259999999999999357, 0.03299999999999992]
mas_4 = [-0.00200000000000001556, 0.0070000000000000561]
First = 1.012083333333286
Second = -2.11458333333288
Для продолжения нажмите любую клавишу . . .

```

