Іванов Кирил  
ФІТ 2-8

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **№8** |  | -3 | -2 | 0 | 2 | -4 | -1,5 | -1 | 1,5 |
|  | -22 | -13 | -7 | 23 | ? | ? | ? | ? |

Код

import numpy as np

import matplotlib.pyplot as plt

from scipy.interpolate import lagrange

x = np.array([-3., -2., 0., 2.], dtype=float)

y = np.array([-22., -13., -7., 23.], dtype=float)

x\_test = [-4, -1.5, -1, 1.5]

def lagrange\_interpolation(x, y, x\_test):

n = len(x)

results = []

for test in x\_test:

p = np.zeros(n)

for i in range(n):

p\_i = 1

for j in range(n):

if i != j:

p\_i \*= (test - x[j]) / (x[i] - x[j])

p[i] = p\_i

result = round(np.dot(y, p), 4)

results.append(result)

print(f"Значення функції {test} = {result}")

return results

f\_interp = lagrange\_interpolation(x, y, x\_test)

xnew = np.linspace(np.min(x), np.max(x), 100)

ynew = [lagrange(x, y)(i) for i in xnew]

plt.plot(x, y, 'o', xnew, ynew)

plt.title('Lagrange Polynomial\_1')

plt.grid(True)

plt.show()

f = lagrange(x, y)

fig = plt.figure(figsize=(7, 5))

plt.plot(xnew, f(xnew), 'b', x, y, 'ro')

plt.title('Lagrange Polynomial\_2')

plt.grid()

plt.xlabel('x')

plt.ylabel('y')

plt.show()





