

Numerical Methods

Homework 11

Due: Wednesday, July 3rd, 11:00am
or per email on Tuesday to **cpopov59@gmail.com**

1. Difference quotient

Consider

$$f(x) = xe^x.$$

Use

$$f'(x) \approx \frac{f(x+h) - f(x)}{h}$$

and double precision to approximate $f'(2)$ in a computer with different values of h .

Which (approximate) value of h provides the highest accuracy?

2. Approximation

Use the least-square method to approximate the points given in the table with polynomials of first and second order. Plot the points and the polynomials.

x_i	1.0	1.1	1.3	1.5	1.9	2.1
y_i	1.84	1.96	2.21	2.45	2.94	3.18

You may use software that you have written yourself. Provide the source code.