Numerical Task NUM1

Task Description

Write a program to approximate the derivative using the following formulas:

$$D_h f(x) = \frac{f(x+h) - f(x)}{h}$$

$$D_h f(x) = \frac{f(x+h) - f(x-h)}{2h}$$

Analyze how the error $|D_h f(x) - f'(x)|$ behaves for the function $f(x) = \sin(x^3)$ and the point $x = 0.2$ as the parameter h changes for different floating-point types (float, double). Plot the error $|D_h f(x) - f'(x)|$ as a function of h on a logarithmic scale.

Additionally, experiment with other functions and points to observe the behavior.